Vol. XXIX APRIL 1935 Number 4

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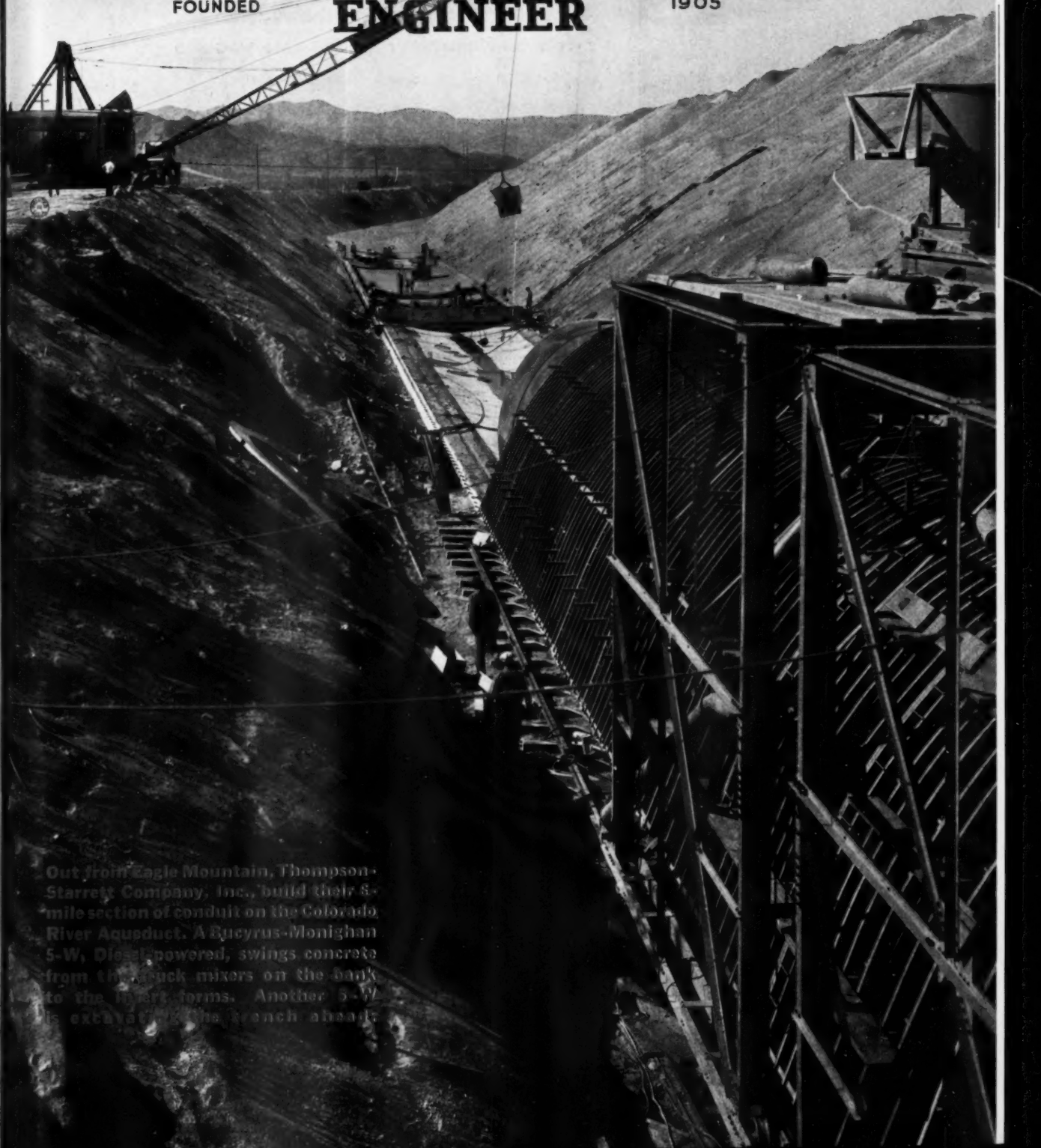
EXCAVATING ENGINEER

FOUNDED 1905



Out from Eagle Mountain, Thompson-Starrett Company, Inc., build their 6-mile section of conduit on the Colorado River Aqueduct. A Bucyrus-Monighan 5-W, Diesel-powered, swings concrete from the truck mixers on the bank to the liners' forms. Another 5-W is excavating the trench ahead

ON THE JOB—IT'S A SHOW-DOWN

Moving big loads over any kind of footing —at record low costs—that's where the "Caterpillar" Diesel Tractor shows the stuff it's made of. Have your dealer give you the performance figures on the thousands of "Caterpillar" Diesels—engines and tractors—now building profits for power users all over the country. Test it in action on an operation of your own. For low costs, sure power, easy handling, convenient service—the "Caterpillar" Diesel wins in a SHOW-DOWN. Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

Earth-moving costs have hit new lows on the Mississippi Levee since "Caterpillar" Diesel Tractors have been on the job. This one, at Elaine, Arkansas, is hauling from a dragline at a fuel cost of 15 cents an hour.

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EXCAVATING ENGINEER

DEVOTED EXCLUSIVELY
TO EXCAVATION

About Excavating Projects — By Excavating Men — For Excavating Men — The World Over

Vol. 29 APRIL, 1935 No. 4

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Hawaiian Dredging Company use unusually wide trestle to expedite handling of stone at breakwater.

Old Spanish Trail Goes Modern.
W. W. Vann & Company, Mercedes, Texas complete 10-mile section of famous trail in quick time.

Building San Gabriel Dam No. 1.
The construction of this huge rock fill dam presents many interesting features. West Slope Construction Company is the contractor on this $8,000,000 project.

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F. O. WYSE
Managing Editor

ARNOLD ANDREWS
Editor

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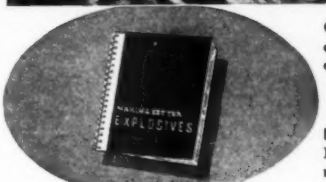

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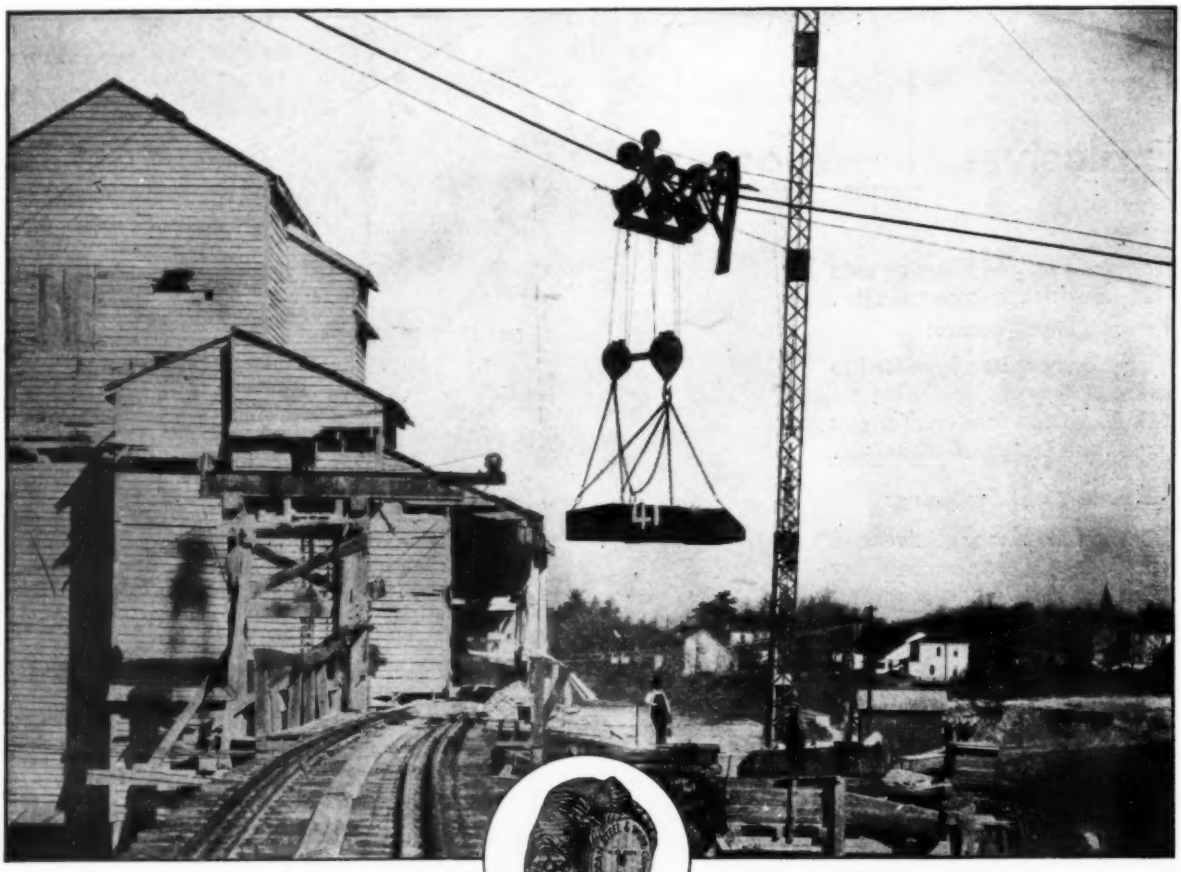

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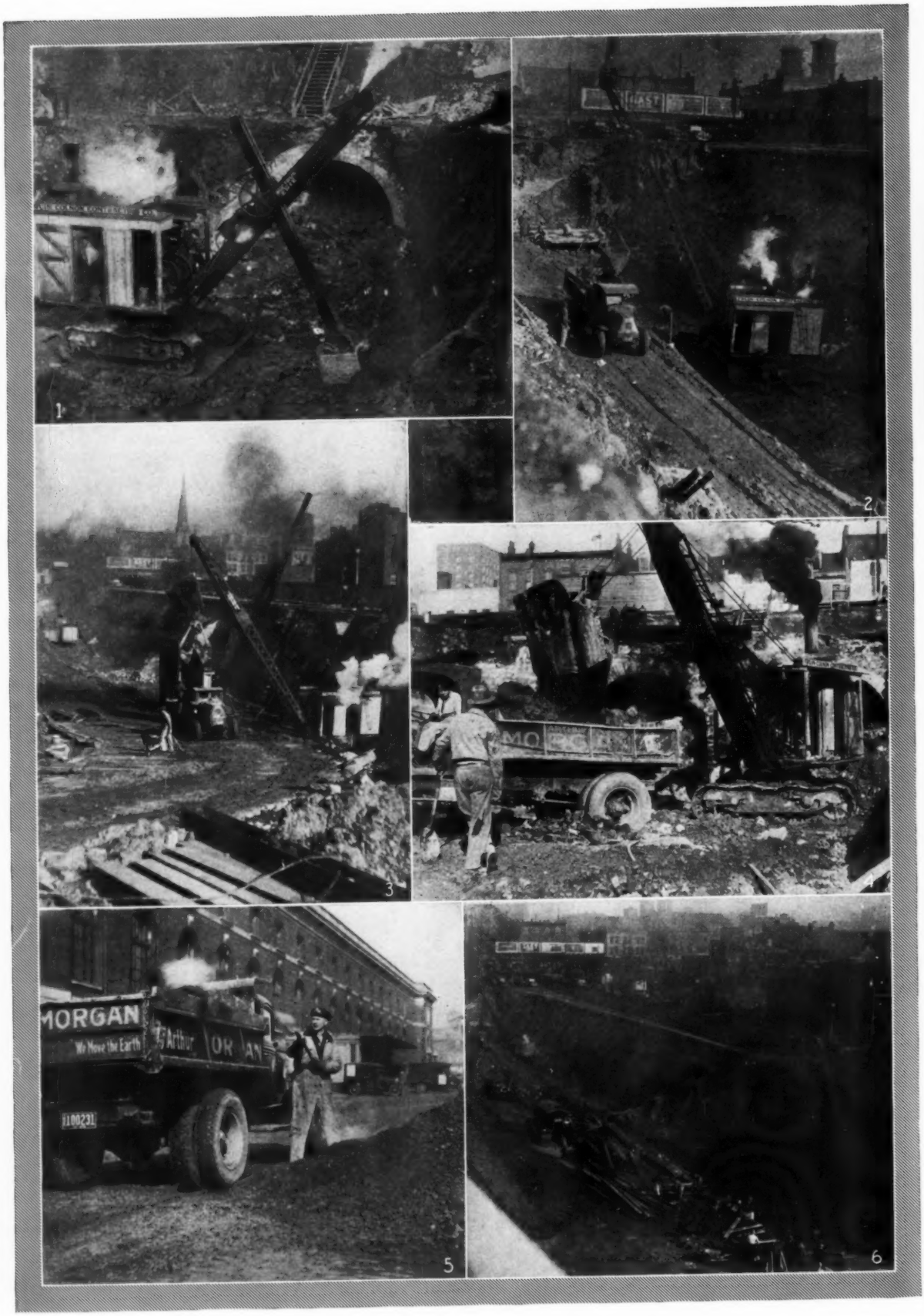
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EXCAVATING ENGINEER
FOUNDED 1905

APRIL 1935
VOL. XXIX NO. 4

Largest St. Louis Basement Presents Unusual Digging Problems

Fruin-Colnon Contracting Company moves approximately 128,000 yards of dirt with steam-powered shovels and clamshells

VISITORS arriving at the St. Louis Union Depot on October 25, 1934 might have noticed a group of people on the vacant area just to the east of the busy terminal. Some might have known that the ground-breaking ceremonies preparatory to starting the biggest basement excavation in the first city of Missouri were going on; some might have realized the start of St. Louis' five million-dollar post-office building was taking place as Congressman Cochran of St. Louis wielded the ceremonial "first" spade. But to Fruin-Colnon Contracting Company, low bidders on this $306,500 basement job, it meant the start of a hustle that would put three shifts on the go until the middle of December and one shift thereafter until the completion of the job.

The new postoffice site has an area roughly equal to four city blocks. The property fronts on Market Street on the north and extends 752 feet to Clark Avenue on the south. From the Eighteenth Street line on the west, a frontage of 404 feet extends to (new) Seventeenth Street, which was formerly Moore Street, on the east. Old Seventeenth Street from Market to Clark Avenue, and Walnut Street from Eighteenth to (new) Seventeenth Street, have been conditionally vacated to make room for the new Federal structure which will have a ground floor area of 154,000 square feet.

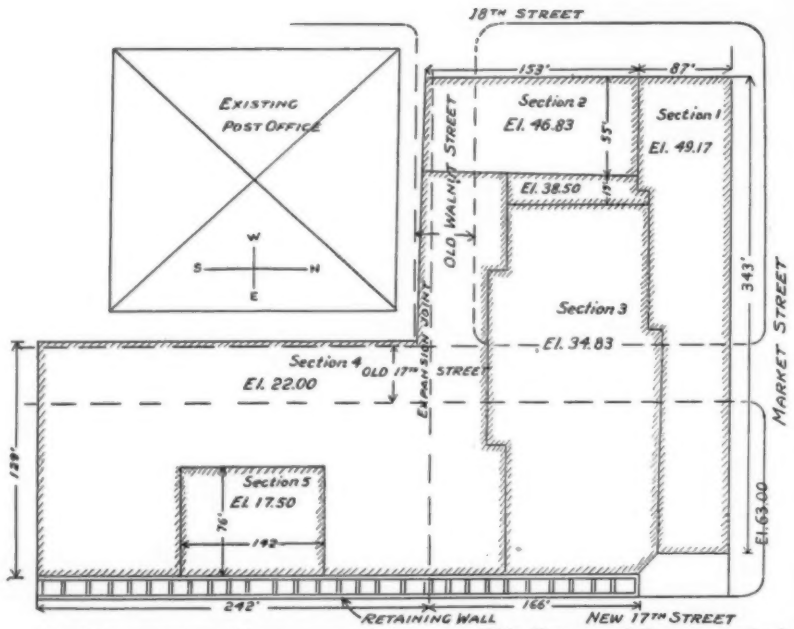
The building itself will face Market Street with a width of 343 feet, and total depth of 480 feet. The front line of the new building is to be sixty feet south of Market Street. The completed postoffice will be a three-story structure, with stone and brick exterior facing. Its cubical contents will be approximately eleven and one-half million cubic feet.

Frontispiece:

● *1. An interesting feature of this excavation job was the uncovering of the extensive system of tunnels whose existence had long been forgotten. 2. The engine room was excavated to a depth of 46 feet below the street level. The clamshell does the final cleaning up. 3. Sheet piling was required along the south end of the retaining wall. A Bucyrus-Erie steamer did the trick. 4. Operator N. Prime heaps a load on the truck. 5. A few shovelfuls of cinders thrown on the bottom of the empty truck made dumping easy. The load of clay and dirt slid right out. 6. At work in close quarters along the east side of old 17th Street, the steamers uncovered the three tunnels which can be seen in the center of the illustration. The lower tunnel, it is thought, was formerly the source of the brewery's water supply. In the tunnel, immediately above, the walls were covered with pictures and inscriptions.*

Illustrated above:

● *Here, we look north from the top of the old postoffice building. In the lower left, Frank Gorman and his Bucyrus-Erie steamer keep the Morgan trucks busy. Near Frank's machine we see another Type B steamer changing over from shovel to clamshell preparatory to digging the excavations for the caissons. Close by is the Marion gas-electric earth boring machine and behind it is the "construction yard" for the cylindrical caisson forms. The St. Louis Union Depot is at the extreme upper left across 18th Street. In the center of the picture, Norm Prime and his Bucyrus-Erie B-2 clean up close to the old brewery tunnels. Directly above the shovel is the temporary office of the Fruin-Colnon Contracting Company with the compressor shack on the left, and the construction engineer's temporary office on the right. To the right of the barrier, R. W. Allen clams out the northeast corner of the engine room with an Owen bucket on a Type B steamer.*



● *This diagram of the new post office basement (not to scale) shows the various elevations to which the excavation was carried.*

● *Ground conditions on this part of the job required the driving of approximately 10,000 square feet of sheet piling. A clamshell machine finishes digging out the footing for the 408-foot retaining wall.*

At the present time a postoffice building, entirely inadequate to the needs of this metropolitan city, stands on the southwest quarter of the new postoffice site. The new building will be built around the present structure in the shape of the letter "L", and, after enough of the new building can be occupied to make it possible to vacate the old postoffice, the latter will be torn down to make room for the completion of the modern structure. The estimates of the project include the razing of the old building, but the excavating contract does not include any alterations in the subgrade on the site of the building to be destroyed.

128,000 Yards to be Excavated

The Fruin-Colnon contract calls for the excavation of approximately 128,000 yards of earth and rock, of which the latter is not expected to run more than about 3,000 yards. Much of this rock excavation involves the removal of old masonry tunnels that were once used as brewery cellars. Later they were used for —well, local gossip says they were employed for a variety of purposes, some none too dignified. These are rumors, probably not without some foundation as to fact. Definitely, it is known that exploration led to stairway exits from several of the dwel-

lings and business places in the neighborhood. But we are getting ahead of our story—we'll take to the tunnels when the shovels get to them.

The excavation proper, insofar as elevations are concerned, may be said to fall in five units or sections, as shown in the accompanying diagram. Section 1, running the width of the building on Market Street and along the 18th Street side, is to be taken out to Elevation 49.17—or roughly 14 feet below the level of Market and (new) 17th which is at Elevation 63.00. Section 2, fronting on 18th Street, is to be excavated down to Elevation 46.83—or approximately 16 feet below Market Street. Section 3

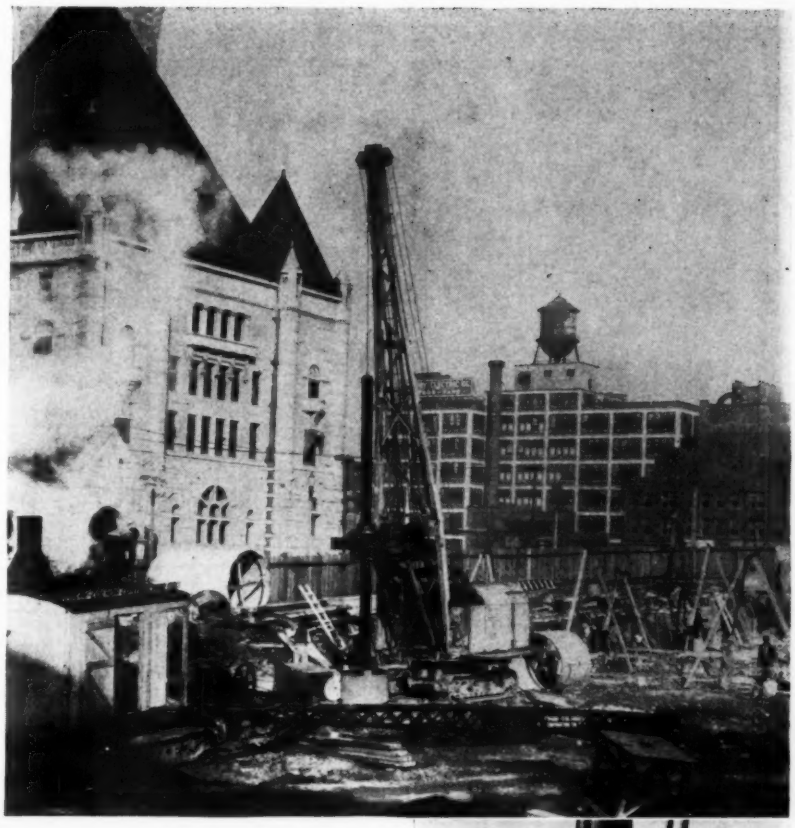
● *Left to right: Joseph Vollmar, Vice-President of Fruin-Colnon Contracting Company, and George Newell, Superintendent, see to it that the work moves smoothly forward.*

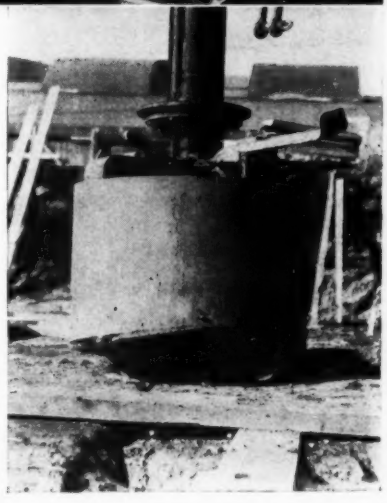
drops to Elevation 34.83 (28 feet below Market Street). Section 4 will be "L" shaped around the two sides of the present postoffice building and will be dug out to Elevation 22.00. The last section, to provide for the engine room, 142 feet long and 76 feet wide, along the 17th Street side of the building, reaches Elevation 17.50 —or roughly 46 feet below Market Street.

Separate Ramps Speed Hauling

Fine, you think. A hole to be dug . . . four separate elevations to keep an eye on . . . bring on your shovels and trucks. But wait. Old 17th Street, running from north to south across the very center of your digging patch, must be kept open for mail trucks until the Christmas rush is over! It's not just straight digging. You must get down to Elevation 17.50 on the east side of your contract and you must not let Moore Street (which becomes new 17th Street) nor old 17th Street slide down into your engine room.

Six Bucyrus-Erie Type B steam shovels were brought in on the job—and it didn't take long for things to begin to hum, either. Loading was to trucks and, at the start, excavating the first fourteen feet was straight going. As the work progressed suitable ramps were provided for the trucks to use when the shovels were deep down in the hole.





● *Above: The Marion gas-electric with boring machine stands by for a few days until needed. In the left foreground a Bucyrus-Erie steamer is being changed over from a shovel to a clamshell. Below: The business end of the boring machine is all sharpened up ready to go.*

Practically at all times there was room for the trucks to pass the shovels and take a separate exit ramp. This speeded up the work and kept the cinders flying out of the stacks most of the time.

On the east side of Old 17th Street two of the shovels were converted to clamshell machines. These were used to clam out the corners of the engine room elevation, loading to trucks on a ramp considerably above the

● *Left to right: H. E. Flora, Pile Driver Foreman; R. W. George, Office Engineer; Dan Mackin, Assistant Superintendent; and T. F. Cresswell, Engineer.*

level of the digging. Later on, these clamshells were put to work digging out the footing for a retaining wall 408 feet in length, at the east side of the building. Due to ground conditions it was necessary to drive approximately 10,000 square feet of sheet piling on both sides of the wall footing along the south end.

Shovels Uncover Old Brewery Tunnels

The shovels on the north section of the operation encountered the old brewery tunnels when they were within about three feet of grade. This last three feet of cut, consisting of rock, brick and debris, was knocked loose with air hammers and used to fill in the tunnels underneath.

In going down to Elevation 34.83 in Section 3, part of the old masonry tunnels were taken out. A view was thus obtained of the excellence of their construction—nothing unusual in comparison with the way such work was performed eighty-odd years ago, but yet a stark reminder of this day's changes which bring us to expect as an ordinary thing the obsolescence of a machine, and even a building, in the space of a single generation.

The existence of these abandoned brewery cellars was known to only a few people. The first cellar, which used to lie beneath store buildings, had thick masonry walls and stone and brick columns. At one end was an abandoned mushroom bed. Underneath this, about 50 feet below the street level, was a deeper cellar, accessible only by means of a rickety ladder and a small arch in the rear wall. This cavern was almost a block long, with a long main gallery and two side galleries. At one end where the cave arched up a faint gleam of light lessened the tomb-like blackness of the place. No sounds, however, from the street could be heard. In the ceiling of one of the tunnels were crumbling manholes whose tops were once gratings in the sidewalks.

In a side gallery and imbedded in a stone wall were found tablets dedicated to the founders of the brewery, Julius Winkelmeyer and Friedrich Maria Stifel, his brother-in-law. The German inscription relates that Mr. Winkelmeyer died January 23, 1867, "of throat inflammation," and that Mr. Stifel died June 27 or 28, 1849, of cholera.

Julius Winkelmeyer was born in 1816, in Heilbronn, Wurtemberg, Germany, of a well-to-do family. His father was a nail-maker by occupation, and Julius learned the same trade. After coming to St. Louis, however, he made the acquaintance of Friedrich Stifel, and the result was that in 1843 the two established themselves in a small way in the brewing business.

Trade prospered and in 1847 they build a new brewery in order to meet the increasing demand for their product. After Stifel's death in 1849 Winkelmeyer continued alone, until his business as a pioneer brewer had become the largest in St. Louis, and one of the largest in the United States. After his death in 1867 his widow carried on until 1889, when the plant was purchased by the St. Louis Brewery Association and renamed the Excelsior Brewery. The plant was torn down soon after the passage of the Volstead Act, but the immense cellars remained.

● *Out in the pit we find Fireman Frank Hollenbeck, Operator R. W. Allen, and Fireman T. J. O'Connell.*

● *Here are some of the boys who keep the dirt flying. Left to right: Operator Frank Gorman; Compressorman F. Gerard; Operator J. S. Morgan; Operator N. Prime; Fireman H. Welsher; Operator H. C. Pope; and Fireman Wm. Kalin.*

The subcellar of the brewery was partly dug and partly carved from limestone bed-rock. Seventy years ago the maturation process required that the beer be placed in a cool place for a comparatively long period of time. There was a special cellar in which the liquid was placed in order to ferment. Forty-gallon wooden hogsheads used to stand on brick and wooden rails. Two of these giant barrels are intact today and staves of others lie nearby. Many of the oak rails are in good condition, although iron ceiling fittings and pipes are badly rusted. Years later when newer cooling methods came into vogue, the subcellar was partly filled with cinders, probably dumped from the brewery boiler room.

Cap Well Which Supplied Brewery

Near the center of the east line of the excavation, one of the cellars evidently provided the water supply for the old brewery. Two Jaeger 6-inch self-priming centrifugal pumps were put to work in this hole and in less than a day had poured out some 80,000 gallons of water. This well when

(Continued on Page 206)

Draglines Transform Swamp to Playfield

By SPENCER A. JONES

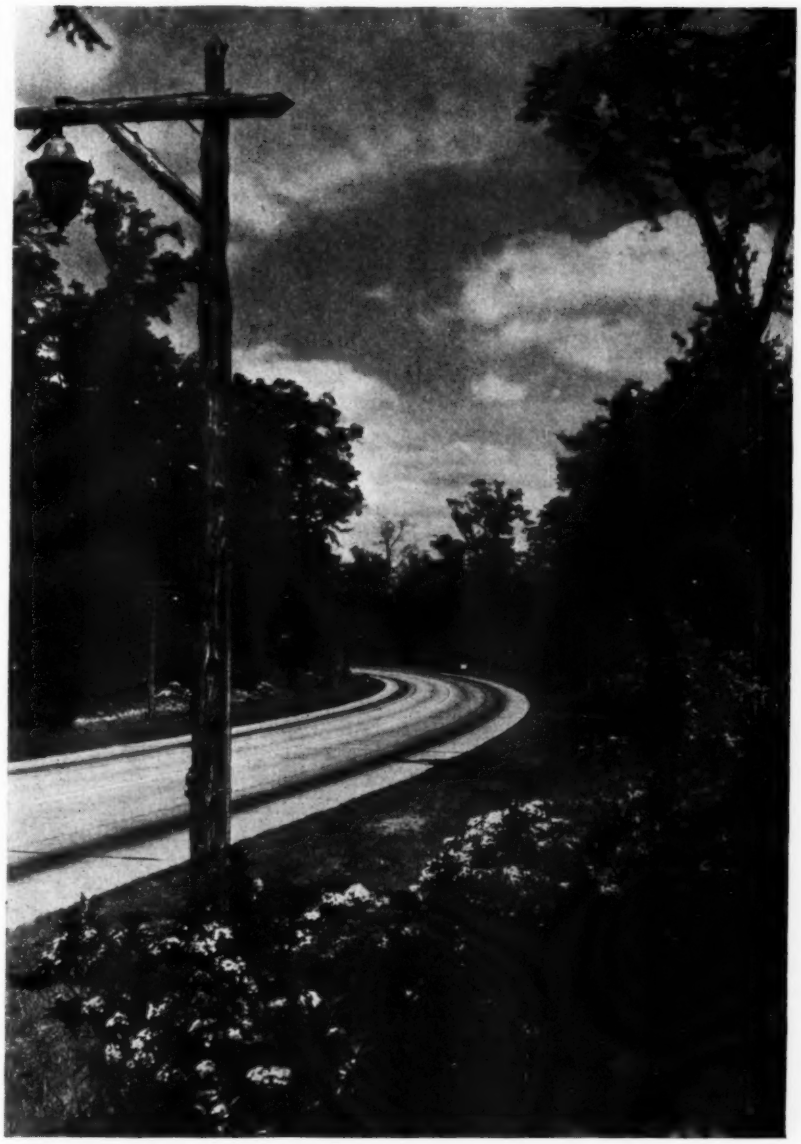
THIRTY-ONE ACRES in Pelham, Westchester County, New York, most of them formerly swamp land, are now in process of being made over into a lake surrounded by a children's playground, tennis courts, baseball diamond and football field. Known as the Pelham Playfield Project, the work is being done for and by the Westchester County Park Commission with its own equipment under the supervision of its Engineering and Construction Department, Chester A. Garfield, Principal Assistant Engineer and Lee R. Stuffler, Superintendent of Construction.

Three-fold Benefits

Work was started in 1933 with the three-fold object of providing work for unemployed, providing improved play facilities for nearby residents, and vastly improving the appearance of what was formerly an eyesore adjacent to one of the country's most beautiful pleasure drives, the Hutchinson River Parkway.

R. W. Burroughs, superintendent of the job for the Park Commission, has about 150 men working under him, altering the former winding course of the Hutchinson River and diverting it to a new channel on the far side of the playfield from the Hutchinson River Parkway, and grading the grounds. A small dam will impound the river sufficiently to create an attractive little lake.

Two Bucyrus-Erie D-2 Diesel-powered draglines, owned by the Westchester County Park Commission, are used for all rough grading, together with the usual equipment of dump trucks. The illustration, on page 178, shows some of this rough grading in process with the partially completed lake showing through the heavy fog in the background.



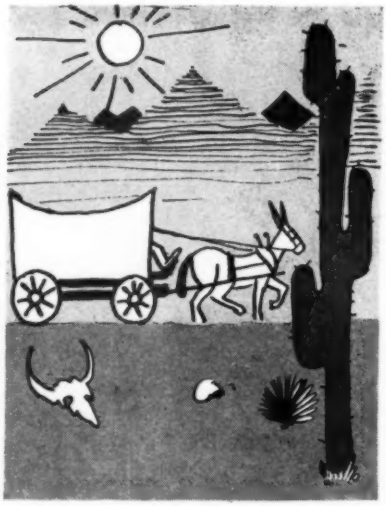
● *Hutchinson River Parkway, Westchester County Park System; for pleasure vehicles only. One of the most beautiful highways in the country, yet it runs through one of the most thickly populated sections of the United States.*

All labor is on Emergency Relief; helpful in that it gives more men more work, but rather a disadvantage from the viewpoint of those who are in responsible charge of the job. Each man is permitted to work not more than a certain number of days per month. In the case of dragline operators, this means that it is not possible to work the draglines continuously or even regularly every day. The total permissible

(Continued on Page 178)

We're Movin' Again

By AN OPERATOR'S WIFE



● *The pioneers had nothing on us we moved 35 times in six years.*

I LISTENED with dismay to my husband bounding up the stairs. When he comes tearing up like that, it can mean only one thing. The door opened a crack and he stuck his head around the corner. Literally, there was a grin from ear to ear on his face as he announced, "We're movin' again". Huh! as though I didn't already know it!

When we were married, I hadn't thought that life was going to be one grand tour of shacks, tents, rooming houses, camps,—anything in fact, just as long as it was on the job and some kind of a roof over our heads. When I say "on the job", I mean just that. If my husband could step from the front door onto the machine, fine. If we were on the second or third floor and he could climb out the window, slide down the boom—well, that wouldn't be quite so handy, but it would be O.K., too. We moved thirty-five times in six years—anywhere from one to a thousand or more miles—so we could be on the job.

In this case it was one of the thousand mile jaunts; to Philadelphia, to work on the new subway that was under construction. I could pack a few of our possessions, see that they were shipped, and come on to Philadelphia after him. The same old tune of me following, but I was getting used to it. He had to start next morning. "How long?" sez I, "Oh, about a year and a half," sez he.

Four days later, bringing up the rear guard, I landed in the Quaker City at night, and proceeded to hunt for friend husband. Armed with the company's name, I phoned the office and persuaded somebody—I imagine it was the night watchman or timekeeper—to hunt up my husband's address. With that in hand, I interviewed one of the "finest", who pointed out the street car for me to take. He needed to—I think the New Deal got its alphabetical ideas from Philadelphia street cars. I know I could never make head or tail out of 'em.

When I got off, it was no trouble at all to find the job. Though I was two blocks away, I couldn't help hearing the familiar whine of the gas engines on the cranes and the rumble of the trucks. Broad Street—it was correctly named all right. Lights everywhere, and men working. They had torn up the paving and laid down planks the full length of the job—about a mile and a half. Hundreds of planks,—yes, millions of 'em, I guess. A million or more feet, I'll bet. Well, anyway, it looked like it. Can't you imagine the traffic running over that planked road? It reminded me of a thunderstorm, day and night.

● *When he comes tearing up like that, it can mean only one thing—we're moving again!*

I found the particular spot my lord and master termed home, for the moment. A boarding house. Next morning, when I had succeeded in downing a part of my breakfast, *I* suddenly decided—"we're moving again."

"Well, all right," sez he, "I'd thought we could store the stuff and board for awhile. If we move, it's got to be on the job."

I found a place. If he'd ever stumbled going down the stairs, he'd have landed right in the company's office, across the street. Once moved in and settled, I began to look around to see what all the noise was about. It was a twenty-four hour proposition—that noise—day and night shifts.

A crane would come lumbering down the street and stop. Up would come a few planks, enough to allow the bucket a bare clearance. A guard rail would go around the hole, and digging would start. Under the street a couple of men had to guide the bucket as it quickly got out of the operator's sight. As the hole grew larger, the crew was increased,

● *I landed in the Quaker City at night and started looking for friend husband.*

and they started digging the dirt by hand, shoveling it over within reach of the bucket. Another crew put in huge timbers to support the planking, and it was seldom that traffic was held up even on part of the street. About the only time I saw folks have to detour was when the steel beams were laid and that was mostly done at night and in sections. It really was a sight worth seeing. Lights were everywhere—searchlights, red lights, smoke pots. Men stampeding back and forth while a tall crane gracefully balanced a long steel beam in mid-air before gently dropping it into place.

Of course, there is a man pulling the levers. He counts considerable. Don't I know? I tried pulling 'em once myself, back when I was first married. My husband had the bright idea of teaching me to run the crane. I could then grease and oil for him, and look at all the money I'd be making! Keep the night and day shift all in the family. Well, I honestly did drive a crane three miles—plenty of time to think things over on that drive. When we got out to the job, it was after 6 o'clock and nobody was around, so it seemed a good time for my first lesson. "Feather-touch control!" The controls were set for a 190-pound man, and I weighed about 115. What I didn't do to the cable on that machine was a caution! I think I wrapped it around everything from the crawlers to the crows' nest and the mizzen mast. I tried to dig my husband out from behind me with the bucket, but couldn't quite make it. It was a lovely evening! I never did hear any more about having two operators in one family, though.

To get back to building the subway. Let's see—we were placing beams in the lamplight, weren't we? When they got a place dug out large enough for a small air-shovel and a couple of trucks, a section of planks was hauled out. Long ramps for the trucks to run on were put in, while an air compressor was installed above ground, at about the center of the job, to supply the air-shovels and other air-run machinery. Right here I say the company's efficiency expert fell down on his job. No compressor was necessary! After being married to an operator for 12 years, I know they spout enough hot air to keep any size machine going. I know, there may be exceptions, but did you ever hear two or three of 'em with their heads together?

"Why say, when I was on so and so's job, I put out—" It's never the present job that's so big. On that, they say: "If they'd just give me trucks enough—" or, "If that d—— machine would only stop acting up—." It goes on like that till the wee small hours. I'll bet you never heard one say, "That guy? Say I can work circles around him." Oh no! If, however, the "guy" in question makes him look like a 1914 model —well, it's only an accident anyway.

● *Manna from heaven — but no coffee!*

● *I think the New Deal got its alphabetical ideas from Philadelphia street cars.*

I went under-ground one day to see what things really looked like —accompanied by my better half. I felt very much as though I'd been dropped in the bottom of an ant hill with a bee's nest in immediate connection. Men shouted, rushed around. Air spades rattled, shovels snorted, trucks roared.

Great steel beams stretched overhead, supported by huge timber braces;—yet, someway, it all made you want frantically to get out from under before the thing caved in on you. I was kept busy dodging all kinds of equipment, and to top it off, the air was blue. They *said* it was gas from the trucks. Well, maybe. But after years of an operator's choice vocabularly, blue air meant just one thing to me. The trucks were large enough to take the blame, though — five-yard Macks mostly, I guess. I think Dante must have had a subway construction in mind when he wrote his "Inferno." At least, that place was my idea of inferno. I've often wondered why some bright soul

didn't think of using those air-spades for a New Year's celebration, they make the grandest racket.

We arrived in Philadelphia along about New Year's, and when I think of the great amount of work done while we were there, I don't see how they accomplished it. It was so long ago that I'm not going to commit myself by saying just how many yards were taken out, but I do remember that they had a part of the job opened under-ground by the first of June.

Along towards the latter part of June, the head of the house began to give a passable imitation of a bear with a sore head. Didn't like to work nights. No sense to it, anyhow; when you didn't have to. You could get more pay, and for shorter hours, too. I began to keep an ear cocked, but a bakery truck created a diversion for a couple of nights.

It seems that a young chap came sailing — I mean driving, why I get my landical and seaical terms mixed, I don't know—up the middle of the street at about 2 A. M. He must have been asleep or color blind—prohibition was in force—for he drove right smack over two red lanterns. He was going so fast he went through the guard rail, hopped the first space, landed on a beam over in the next section, turned a complete somerset and landed right-side-up on the bottom. During this acrobatic stunt, he distributed boxes of pies, cakes, cookies, buns, and cream puffs—keep them in mind—in all directions. Fortunately, none of the men below was caught under the truck, but all had a free lunch. One colored gentlemen gazed hopefully up at the hole and said, "If de Lord jes see fitten' to drop a milk truck amongst us, now—"

About then he spied an officer gazing down over the edge, watching the raving and gesticulating truck driver ride up on a bucket of dirt. The officer called down to ask if anyone had been hurt, and the colored gentlemen, not wishing to be stingy with the "manna", tossed him a cream puff. It was a beautiful shot—

● *Air spades for New Year's celebrations — they make the grandest racket!*

landed right under the officer's chin and spread down the front of his immaculate uniform. Was that man mad! He promptly arrested the wailing truck driver and hauled him off to jail.

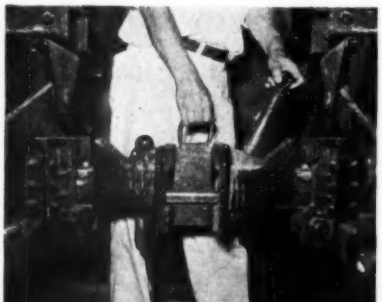
After the delights of this wore off, the growls and mutters began again. "All this night stuff gets my goat! Too monotonous!" Say, while I think of it, why not install a radio in every crane, to keep the operators happy. Then if the radio station could be persuaded to play something lively, it wouldn't be necessary to have these "Slow men working" signs. Anyway, the storm broke a couple of nights after the bakery truck episode. I heard my husband bounding up the stairs. There's no other noise just like it, unless it might be an elephant taking half the stairs at one jump. I got set for the door to open, and half wished I had one of those boxes of cream puffs. Oh well, we'd stayed on this job six months, and that was a lot.

Yes! We were moving again.

I've never been back to see the finished subway. But in imagination—with due apologies to Philadelphia—I think of a very animated worm hustling back and forth through a tunnel dug by a bunch of busy, noisy ants, with a number of long-necked cranes in attendance.

Listen! What's that noise on the stairs? I knew it. We're movin' again!

Bar Coupler Features Safety Handle

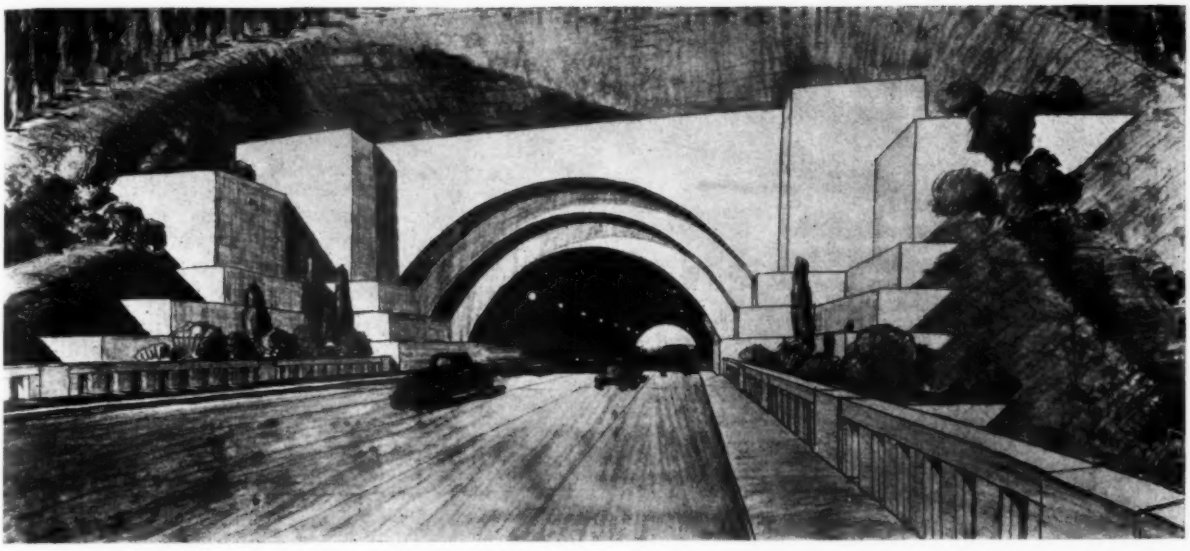


THE ILLUSTRATION above shows a type of modified bar coupler which is in use on the Colorado River Aqueduct. Note the safety handle that places a man's hand outside of the danger zone, and the plate that prevents the coupler heads coming together.

According to T. W. Osgood, Safety Engineer on the Aqueduct, haulage accidents rank among the chief contributing causes of injury to workmen in tunnel construction operations. Among these, the coupling of cars presents one of the greatest hazards, frequently resulting in crushed fingers and hands and sometimes in injuries of much greater severity.

Automatic couplers, superior to all other types from the safety viewpoint, predominate in use on the Aqueduct work. Of the other types such as link and bar, the greater percentage is equipped with safety features. This, together with safety training of the men, has brought about a low accident experience in connection with haulage.

—John R. Marcy



● *Artist's sketch of West Portal, Yerba Buena Tunnel.*

World's Largest Tunnel for Bay Bridge

Tom E. Connolly excavates world's largest cross section bore through Yerba Buena Island, being built as part of the $77,000,000 San Francisco-Oakland Bay Bridge.

By C. W. GEIGER

THE SAN FRANCISCO-Oakland Bay Bridge, supported by high massive piers, reaches out from San Francisco, traverses Yerba Buena Island through what is stated to be the world's largest bore highway tunnel, and then, by means of more high piers, touches the mainland at Oakland. Its "two deck" construction provides, on the upper deck, six lanes for fast moving automobiles and, on the lower deck, three lanes for trucks and two interurban-railway tracks.

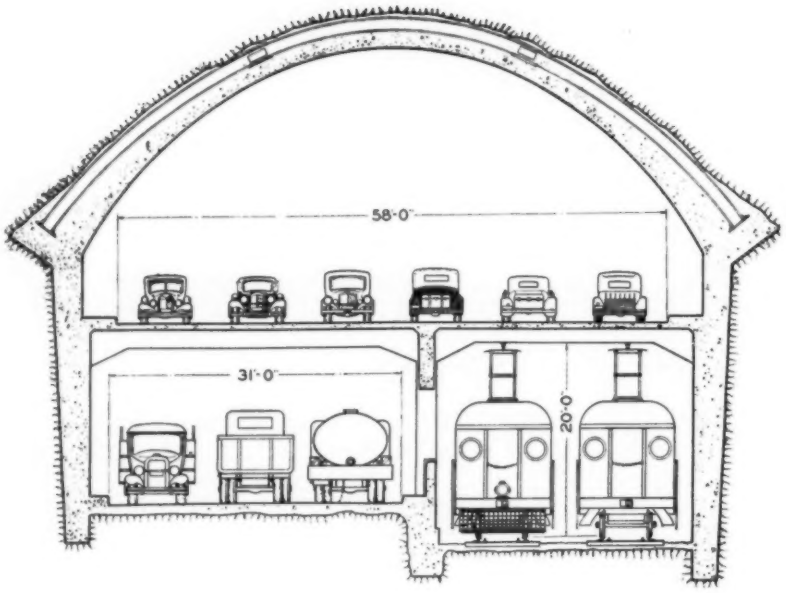
The Yerba Buena Island route for this great bridge required approval by the United States Government because the Island is a military base. The Federal authorities finally not only permitted the use of Yerba Buena Island as a mid-bay anchorage, but also allowed the bridge builders to bore a huge vehicular tunnel through the highest part of the island to connect the two sections of the bridge. The tunnel, which is 540 feet in length, obviates the destruction of much valuable property on the crest of the Island.

Never before has there been built so huge a vehicular tunnel (78 feet wide and 67 feet high). While massive concrete and steel walls will take up much of this great width, the completed tunnel will have a 56-foot clear roadway for the two decks and a total height of about 58 feet.

This tunnel is so large that it was built by boring five pilot tunnels through the Island and then breaking them down into the full bore. Two bottom headings at the base of each of the walls were put through from the west portal to the east portal of the tunnel, two more were tunneled through the side walls above these, and the fifth pilot tunnel was drilled at the crown.

A crew of six men were employed at each heading in the first two bottom drifts in drilling and blasting. About 25 holes were drilled to a depth of from 6 to 7 feet for each round, the holes being spaced from 24 to 30 inches apart. Blasting was done with Hercules dynamite using electric primers. Muck was loaded into 4-yard Kopple cars by a Sullivan mucking machine operated by a 75-horsepower electric motor. Approximately two minutes were required to load two Kopple cars. These were towed by Plymouth locomotives to the muck-disposal facilities on the west edge of the island. This consists of disposal chutes and belt conveyors, the latter transferring the muck from the lower end of the chutes to barges.

The $1,821,292 contract for all San Francisco-Oakland Bay Bridge construction on Yerba Buena Island is held by the Clinton Construction Company. T. E. Connolly of San Francisco has the contract for the tunnel excavation work.



● *Cross-section of Yerba Buena Tunnel as it will look when completed. Six traffic lanes on the top deck provide plenty of room for pleasure vehicles.*

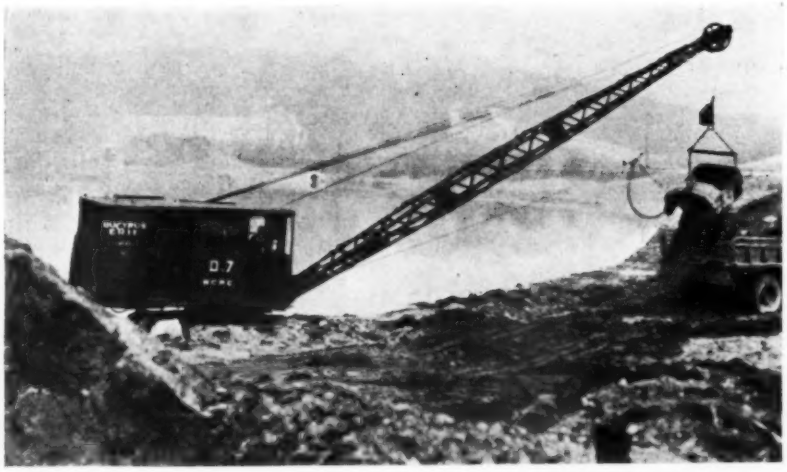
The San Francisco-Oakland Bay Bridge will be 8¼ miles long from the end of the western approach to the end of the eastern approach, the longest highway bridge in the world. It is also the largest bridge in the world and the most expensive, costing approximately $77,000,000. It will span the largest major navigable body of water yet bridged.

The bridge is built by private contract under the supervision of the San Francisco-Oakland Bay Bridge Division of the State Department of Public Works, of which Earl Lee Kelly is Director, and C. H. Purcell, Chief Engineer.

The bridge is financed entirely without taxation, its cost defrayed by sale of bonds issued against the prospective revenues of the bridge. These bonds have been purchased by the Federal Reconstruction Finance Corporation and may eventually be sold to the public.

Dragline Transforms Swamp to Playfield

(Continued from Page 173)



● *Bucyrus-Erie D-2 dragline with one-yard bucket grading at Pelham Playfield Project, Pelham, Westchester County, New York. Leo Hennessey, operator; Nicholas Smith, oiler.*

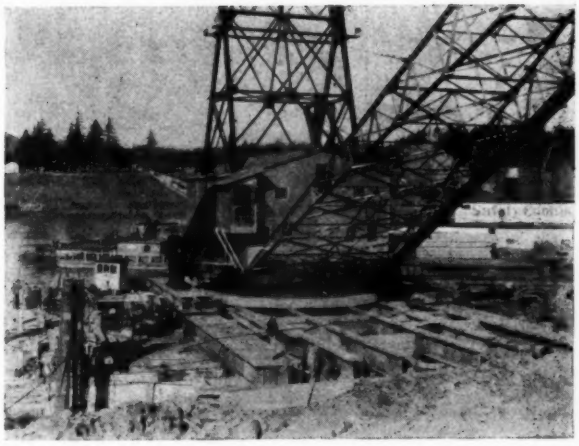
working time of all of the eight dragline operators assigned to the job for the month of December was 42 working days, or in other words, the two draglines could be worked only 21 eight-hour days each.

With Emergency Relief Labor the draglines operate at the rate of from 275 to 325 yards per 8-hour day. Machine No. 7 attained a maximum output for one day of 540 yards.

Although, with labor conditions as they exist, speed of work is a practical impossibility, probably the fact that the 150 men and their families are being provided with food, clothing and shelter offsets any adverse comment regarding time consumed.

AN APOLOGY

IN THE ARTICLE, describing the interesting work being done by Peter Mitchell, Inc., on the Merritt Parkway in Connecticut, which appeared in our February issue under the title "Merritt Parkway Construction Embodies Unusual Features" mention was made and illustrations shown of a Linn tractor which we stated had a capacity of six yards. The Linn Mfg. Company advises us that this tractor carries a dump-body with a capacity in excess of 7 yards water level and when heaped it holds from 8 to 9 yards. We regret the printing of this error.



● *Huge steel beams form a runway on which the dragline walked on and off the barges.*

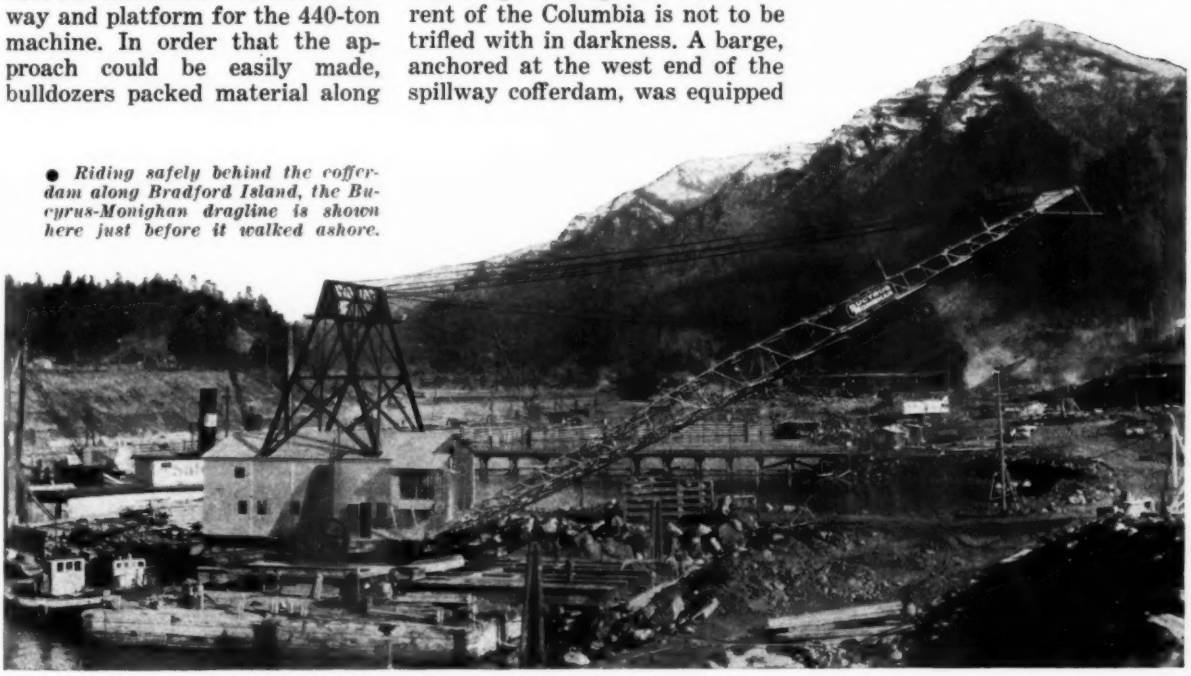
Huge Dragline Barged Across Columbia

By C. M. LITTLEJOHN

AN ENGINEERING feat of huge proportions was neatly executed late in February at Bonneville Dam when Columbia Construction Company barged its Bucyrus-Monighan 6160 dragline, largest of its kind in the Pacific Northwest, across the main channel of the Columbia River to Bradford Island. The dragline had completed its work of channel-widening on the Washington shore. The next job scheduled for it was the excavation within the cofferdam area on the island.

Workmen of the Columbia Construction Company lashed two 600-ton sea-going barges together and placed steel girders and timbers on their decks to form a runway and platform for the 440-ton machine. In order that the approach could be easily made, bulldozers packed material along the bank flush with the ends of the barges. Then the big dragline walked out over the runway taking two steps per minute, each 7½ feet long. Due to its ability to step off in any direction it was an easy matter to place the dragline in the proper position on the barge so that it would ride safely.

Although loading of the dragline had been fully completed by evening, movement across the channel did not start until the following morning. The swift current of the Columbia is not to be trifled with in darkness. A barge, anchored at the west end of the spillway cofferdam, was equipped with powerful hoists. Heavy towing cables extended from this barge to those carrying the Bucyrus-Monighan 1500 feet downstream. With a strain on the cables, the barges were released from their moorings on the Washington shore. Powerful tugs aided the towing engine on the barge and soon brought the huge load safely to shore on Bradford Island, riding quietly in the eddy below the cofferdam. The big dragline walked easily ashore and was soon swinging its big bucket in the Bradford Island digging.



● *Riding safely behind the cofferdam along Bradford Island, the Bucyrus-Monighan dragline is shown here just before it walked ashore.*

FIELD NOTES

Change-Pad Handy Device When Inspecting Ball-Bearings

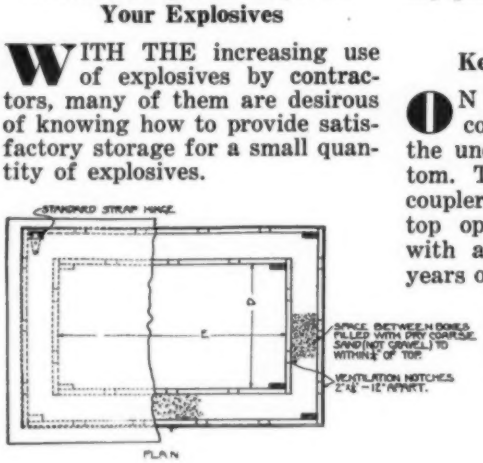
A CONVENIENT aid around the work bench when cleaning and inspecting steel balls is an old, counter change-pad. A number of balls can be laid on the pad. They are prevented from

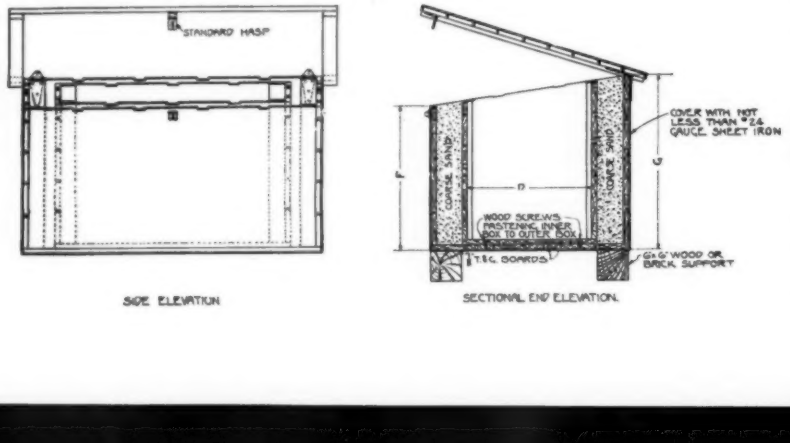
rolling away by the pointed, flexible, rubber prongs. Each ball stays right where you place it. No chance of running into trouble due to a lost ball, as is frequently the case when the balls are thrown in any box or can which happens to be handy.

— Frank W. Bentley, Jr.

Provide Proper Storage for Your Explosives

WITH THE increasing use of explosives by contractors, many of them are desirous of knowing how to provide satisfactory storage for a small quantity of explosives.


STANDARD STRAP HINGE
SPACE BETWEEN BOXES FILLED WITH DRY COARSE SAND (NOT GRAVEL) TO WITHIN 2" OF TOP.
VENTILATION NOTCHES 2"x6" - 12" APART.
PLAN


STANDARD HASP
SIDE ELEVATION
COVER WITH NOT LESS THAN #24 GAUGE SHEET IRON
COARSE SAND
WOOD SCREWS FASTENING INNER BOX TO OUTER BOX
T&G BOARDS
6"x6" WOOD OR BRICK SUPPORT
SECTIONAL END ELEVATION

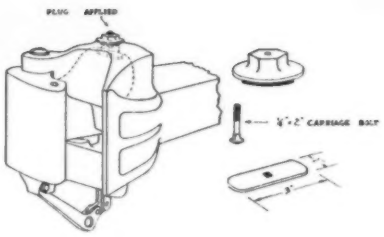
One type of storage equipment shown in the accompanying sketches, is a box made of hardwood two inches in thickness, and completely covered with No. 24-gauge sheet iron, and having a hinged cover with a suitable lock. This box may be mounted on wheels if desired. An interior box should be built, and its dimensions should be such as to permit a 6-inch space at each end and side. The height of the interior box is to be one inch less than that of the outside box, the space surrounding the interior box to be filled with dry, coarse sand. Ventilation is provided by cutting notches at intervals of one foot in the edges of both boxes. The outside box may have a sloping surface if desired. The exterior box should be painted a light color in order to preserve it. Place the word "EXPLOSIVES" on cover and sides for precautionary reasons.

Never store blasting caps or electric blasting caps in the same magazine with other explosives. Fuse should be stored in a cool, dry place.

— Ag-Ex News.

Keeping Couplers Clean

ON MOST air-dump cars the couplers are arranged with the uncoupling lever on the bottom. The hole in the top of the coupler which would be used for top operation is usually closed with an iron cap. After a few years of service a good portion of the cars will have lost these plugs and in consequence, dirt, rock, and ore find their way into the couplers interfering with their operation. The



sketch shows a plug that will stay in.

Obtain some old plugs out of scrap angle-cocks or other plugs similar to these and drill a hole in the center of them to take a ¼" bolt. Cut a piece of steel 3/16" thick by 1" wide and about 3" long, round the corners well, and drill a ¼" hole through the center. With a diamond point chisel cut out this hole to take the shoulder of a ¼" by 2" long carriage bolt.

Pull out the knuckle and knuckle lock from the coupler and insert the piece with the bolt up from the inside. On the outside slip the plug over the bolt, draw the nut down tight and the job is done.

—Vernon Smith.

Resin Improves Babbitt

CUT A PIECE of resin the size of a walnut into the babbitt, stir thoroughly, then skim. This will make poor babbitt run better, and also improves it. Babbitt heated just hot enough to light a pine stick will run in places with the resin in, where without it, it would not run. It is also claimed that resin will prevent blowing when pouring in damp boxes.

Easy Method of Computing Wire Rope Lengths on Reels

QUITE OFTEN wire rope for use on excavating machines is purchased in long lengths on reels. When the machine needs a new rope a length is cut off and used. If no record is kept of the length remaining on the reel the contractor then has no information as to how much remains. To unreel the rope and measure it takes time and labor. A much simpler method is to obtain the length mathematically by using the following formula which I have developed and believe to be more practical and more accurate than any heretofore published.

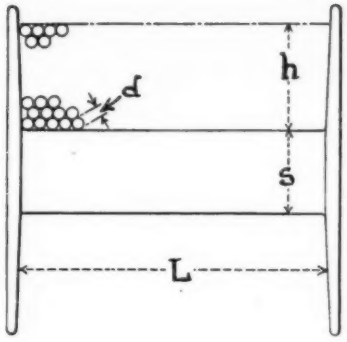
When a rope is wound on a reel it tends to assume a position such

as I have indicated in the accompanying sketch. That is, the rope when wound on top of the first layer seeks the "valleys" between the turns. In this way the maximum length is wound on the reel. This is particularly true if the rope is wound under tension.

To determine the number of feet on a drum or reel properly wound, four measurements are necessary as shown on the sketch:—

h = depth of material on reel, inches;
S = diameter of reel, inches;
L = length of reel, inches;
d = diameter of rope, inches.

The rule is as follows: "To the depth of the rope or cable "h", add "s", the diameter of the reel,



(all measurements in inches), multiply by the depth "h", then multiply by the inside length of the reel marked "L" in the sketch, then divide by the square of the diameter of the rope or cable, and lastly multiply by 0.3. The answer is the length in feet.

$$\frac{(h+s)\ h \times L \times .3}{d^2} = \text{Length of rope in feet}$$

Take for example, a reel in which h = 10 in.; S = 20 in.; L = 50 in.; and the diameter of the rope, d, is ½ in. How many feet of rope on the reel? Apply the above rule and it will be found that the answer is 18,000 feet.

The above rule, of course, applies to other articles as well as to cable and rope. It applies to any material, round in section, which can be rolled on a drum—wire, cord, hose, lead cable, round leather belting, etc.

—*W. F. Schaphorst, M.E.*

Old Times & Old Timers

When Tracks Were Four-Foot Gauge

OLD TIMER H. B. Whitney, St. Charles, Missouri, wrote in our October issue about the difficulties encountered in excavation work which were formerly obstacles to speed and safety. His experience dates back to 1871, so he has had a chance to observe how progress has been made in mechanical features, design, lighting, and length of working hours. In this letter he tells in more detail about some of the former methods used. They are a great contrast to the care and accuracy of today's workmanship and operations. He writes:

"In my former letter I mentioned that four-foot gauge track was used on construction work by contractors Dull & Williams. In all these years on construction work, I have never found a good reason for construction changing to three-foot gauge. The same weight rail, the same length and size tie was used and we had very few wrecks from bad track compared to the three-foot gauge that was used later. We had wrecks, plenty, but they were caused mostly from bad axle bearings.

"I mentioned in the previous letter how the bearings were secured to the car sills. The job prior to father's supervision had no lathe, drill press or bolt-cutter. All bolts were made and threaded by hand labor. The dies were the common blacksmith shop type that can be found in country shops. A strong-armed man might cut a deep thread and another might just barely make a full or nearly-full thread; consequently a nut fitting one bolt would not fit its neighbor. The nuts were tapped by hand with a taper tap worked in from both sides, so the center thread of the nut was the only one really fitting — perhaps. The cellar of the journal box was bolted up with two half-inch bolts and square nuts, of various-sized squares, some loose fitting, and others so tight that they were not sent home—then a lost cellar box, dry axle and a wreck.

"This looks like bad management, but it was really the bad mechanical condition that could not be remedied fully — and the dirt and rock must move. The locomotives could make twenty miles per hour and regardless of any safety factor, steam to make the time was there and trains were on regular time.

"The new bolt-cutter, when it came, had thirteen threads for half-inch bolts that went into replacement, and then there were bolts of eleven, twelve, and thirteen threads. Five-eighth bolts had ten and eleven threads, and three-quarters bolts were standard at ten threads. There were some manufactured bolts with sharp pointed ends and a large square head with no raised center made to fit tight driving through oak to hold the bearing box to the sill. All bolts were of common iron. No mild steel in those days! Uneven blows of the hammer, that is to say, a hit on one corner, then one on the other, and the bolt needed a new head.

"And in addition to wrecks from bad journals, there were broken flanges. The wheel press was always busy fitting on new wheels. Wrecks were picked up on nights and Sundays. Whenever there was a hard shower the loading pit filled up with mud.

"The principal trouble with the running gear of the locomotives was from the use of tallow for cylinder lubrication. Cylinder oil had not been thought of. The tallow ate the follower bolts in the pistons and the holding down bolts of the steam chests. The pistons had the old-type of spring ring packing. Steel, one-leaf springs were held inside the bull ring with set screw and set nuts. The springs were set so the rings were expanded to fit the cylinder snug, with allowance for expansion, and then the nuts tightened to hold. But how they would give if the water carried over into the cylinder! The only brake was the engine reverse lever and the little cars, when they left the rails, were like a flock of sheep. And with all that, the contractors earned $250,000 with one outfit in two and one-half months!"

EXCAVATING ENGINEER
FOUNDED 1905

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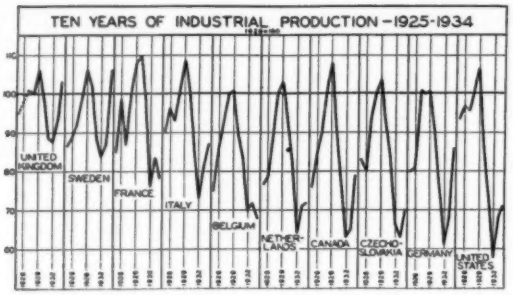
The Business Situation

UPON A NUMBER of occasions during the last five years, we have pointed out in these pages that the present business depression is not a national affair, but an international one, in which many of the earth's nations have shared. It has been a depression in which each nation has not shared equally . . . a depression from which some nations at the present time have largely recovered and in which some nations are still mired. In commenting on recovery in this country we have pointed out repeatedly that certain other nations have made greater recovery than have we.

The following diagram, compiled by the Cleveland Trust Company from data contained in the monthly bulletin on statistics



published by the League of Nations, shows the changes in volume of industrial production for ten countries during the ten years from 1925 to 1934. It will be noted that, of the ten nations represented on this chart, Sweden has made the best record, having recovered to a point not only on a par with, but a little higher than her volume for the year of 1929. Great Britain has made the next best record having recovered almost to the 1929 period. There follow three other nations that have made better recovery records than the United States, namely: Germany, Canada, and Italy. Belgium and France have produced the poorest records.

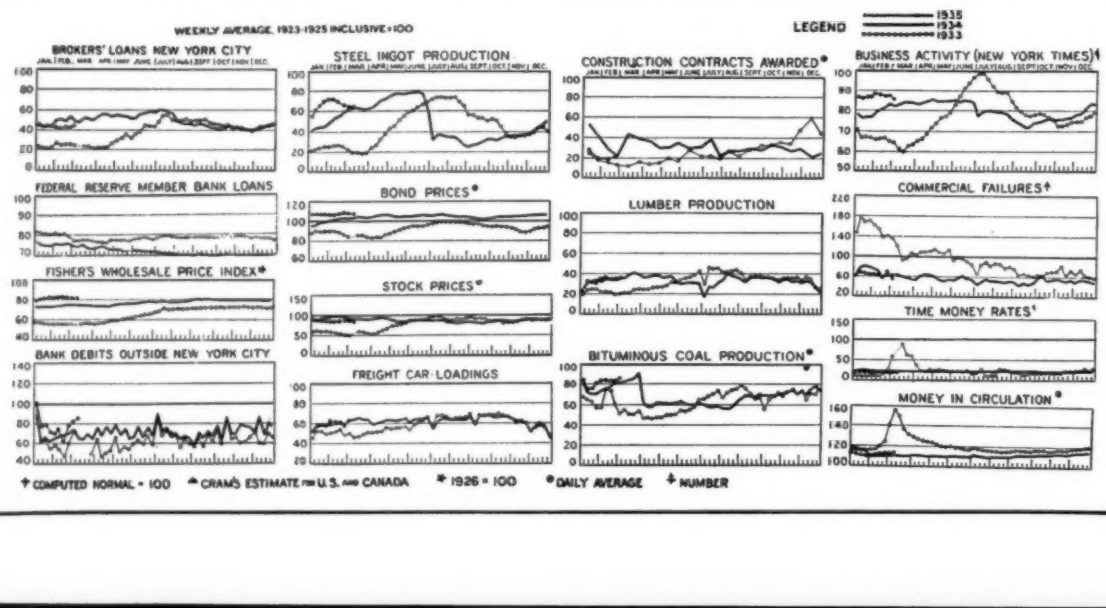
Teaspoons or Power Shovels!

AFTER 200 years experience with manufacturing by machines, we find ourselves still faced with the fallacious theory that machinery puts men out of work. Again and again, in all parts of the country we find men planning to do work by hand labor, in order to "relieve unemployment." If you take a machinist and a shovel-runner and put them to work digging ditches by hand, not only have you failed to satisfy them, but by doing so you have committed a far graver error. You have cut down the output of the individual, reduced his capacity to create wealth.

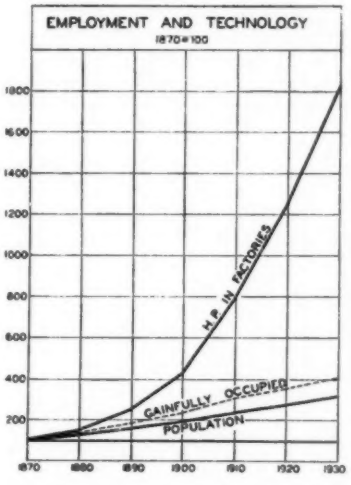
After all, true wealth is not money. It is the things which man creates, and the amount of it being produced governs the standard of living enjoyed by the individuals who produce it. Probably the most serious result of the present depression is not the tremendous shrinkage in capital that industry has undergone. It is rather the tremendous reduction in output that we have suffered. During the past five years we have lost the opportunity to create billions of dollars in true wealth. The nation as a whole, and the individuals that comprise the nation are just that much poorer in consequence. Every reduction in output is a reduction in the creation of real wealth, and a reduction in the standard of living which can be enjoyed by the persons who comprise our nation.

Let's look into the past for

WEEKLY BUSINESS INDICATORS



confirmation of this fact. The records are not complete for the 200 years which have elapsed since machinery began to lift the burden of creating wealth from the shoulders of mankind. But we have fairly accurate and reliable figures for the last 65 years of our industrial life, figures which show the amount of horsepower being used to run machines in factories, the population of the country, and the population gainfully occupied, or occupied in producing real wealth. Since machines and labor-saving devices are almost invariably run by power, the energy or power consumed by industry is an indicator of the amount of machinery in use . . . an indicator of the extent to which power-driven, man-made machines are being called upon to help man in his work. The accompanying diagram reprinted from the Cleveland Trust Company's Business Bulletin for



March is made on the basis of taking each factor as equal to 100 in the year 1870. Thus we see that from 1870 to 1930, installed horse-power increased to 18.3 times the figure in 1870. We see further that during the same interval the total population increased from 100 in 1870 to 319 in 1930, or to 3.19 times the earlier figures. Most important of all, is the dashed line in the diagram that is labeled "Gainfully Occupied." This shows that during the same period, the number of persons occupied in producing wealth increased from 100 to 409, or 4.09 times the number so employed in 1870. In other words, in spite of a tremendous growth in installed power in factories during this 60-year period, the number of people gainfully employed has increased one-third faster than the population itself has increased. Here we find sound confirmation of the statement that every labor-saving device tends to increase the demand for workers and to lift the general average of wages and the general average of the standard of living.

First Aid Training Pays

FIRST-AID training of employees is an educational movement, and education of employees for their own safety is one of the greatest accident-prevention methods we have. First-aid training teaches a man to think in terms of physical suffering; causes him to view unusual situations in terms of safety; creates a tendency to place oneself mentally in the victim's position; induces the pupil to study how to keep himself from being involved in an accident; impels a man to analyze his particular job and, by so doing, foreseeing and eliminating conditions that might bring about an accident; urges men to take more interest in their physical well-being.

It is of interest to note that of a total of 200 first-aid cases reported during the Federal fiscal year 1933-34, according to the U. S. Bureau of Mines, 108 lives are reported to have been saved. In electric shock, asphyxiation, suffocation, and drowning, artificial respiration was successful in restoring life in 67 per cent of the cases reported. These are cases in which it is fairly certain that first-aid treatment saved life, while in arterial bleeding and miscellaneous cases it cannot be said with certainty that in every instance life was saved; however, reports stated that life was saved in probably 70 per cent of the arterial bleeding cases treated. A study of 359 other accident cases on which data are available shows that the lives of 339 persons probably were saved by first aid. These cases include 214 from asphyxiation, 45 from electric shock, 36 from arterial bleeding, 25 from drowning, 9 from suffocation, and 30 from miscellaneous causes.

A large petroleum company analyzed the records of each employee who had been injured and found that only 1 man who had received first-aid training was injured for every 4 who had not received training. This company also found that first-aid classes stimulated safety work, created safety interest, and rewarded the company in returns that could not possibly be compiled.

The general manager of a large bituminous-coal company stated publicly that the experience of his company had been that the ratio of men injured who had first-aid training to those who had not had this training was about 1 to 8.

Are you making systematic use of a safety program on your job? It pays!

Business Conditions

IN ADDRESSING the opening of the 6th annual Advertising Exposition, of the Advertising Federation of America at Columbus, Mr. C. H. Lange, President of the A. F. of A., Publicity Director of the General Electric Company, gave an interesting summary of the business situation. In concluding his talk, Mr. Lange said "I ought to stop there, but, as you will recall, I am expected to dispose of general business conditions in a few concise phrases. That's a grand assignment. I'll do it this way:

"Question — Mr. Lange, what do you think of the gold decisions?

"Answer—Well, regarding gold there are in the United States 7,000,000 automobiles aged seven years. They are dangerous and ought to be replaced. Besides, there are 2,000,000 fewer cars in service than there were in 1930.

"Question—What do you think of trade with Russia?

"Answer—In the United States there are 3,000,000 old and ramshackle homes, scarcely worth wrecking. Five million American families live in tenements and houses below the standard of decency. Modern housing should be provided.

"Question—What do you think the stock market trend will be?

"Answer—In the United States there are 10,000,000 homes that have no electric lights; 9,000,000 lack bathrooms; 13,000,000 are without central heating plants; 14,000,000 have no electric refrigerators; and 10,000,000 radio sets are obsolete. Does that answer your question?"

EQUIPMENT
You Ought to Know About

Davenport Besler Announce New Locomotive Series

ANNOUNCEMENT is made by the Davenport Locomotive Works, a division of the Davenport Besler Corporation of Davenport, Iowa, of a new series of industrial gasoline and Diesel geared locomotives ranging in capacity from 2½ to 25 tons. These locomotives are ideal for a wide variety of services. They are rugged, have a wide range of speeds, and are capable of maximum hauling power at speeds as low as

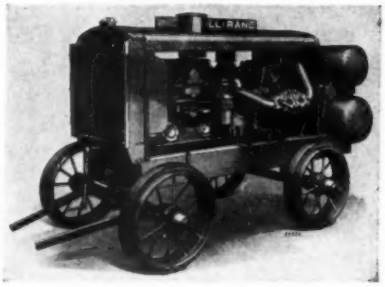
2½ to 3 miles per hour according to the size of the unit. Powerful hand-operated lever type brakes are standard on all of the smaller sizes up to twelve tons. On the seven to twelve-ton sizes air brakes are optional. The fifteen to twenty-five ton sizes are standard equipped with air brakes and auxiliary hand operated brakes of lever type.

Literature descriptive of this new Davenport series of locomotives in sizes of 2½, 4, 6, 8, 10, 12, 15, 20 and 25 tons is now available with detailed tabulations giving haulage capacities for each at all speeds.

Ingersoll-Rand Announces Model 85 Compressor

A NEW two-stage, air-cooled portable compressor has been added to Ingersoll-Rand's comprehensive line of portables. Known as the Model 85 it is driven by a Waukesha gasoline engine, and has a capacity of 85 cfm. at 100 pounds.

This new compressor has two low-pressure and one high-pressure air-cooled cylinders and an air-cooled intercooler. It is claimed by the manufacturer that the air cooling, two-stage compression, intercooling, and certain



manufacturing refinements all combine to make a saving of up to 25 per cent over the fuel cost of water-cooled, single-stage portable compressors; furthermore, that two-staging gives increased efficiency at high altitudes and in hot climates over single-stage units. Cylinders and valve temperatures are said to be 200° lower than in single-stage units, resulting in tighter valves and longer-maintained high efficiency.

Other sizes in which the I-R Two-Stage, Air-Cooled Portable Compressor is made are: Models No. 60, 160, 210, 105, and 315. These sizes are available either gasoline-engine-driven or oil-engine-driven.

Bulletin No. 2149, describing the new Model 85, or No. 2100, describing the entire line, can be obtained from Ingersoll-Rand Company, 11 Broadway, New York, or any branch office.

New Austin-Western Roll Crusher

A NEW reduction roll crusher, built primarily to produce material from 1½" down to dust (though it will handle larger sizes) has been announced by the Austin-Western Road Machinery Company of Aurora, Illinois. According to the manufacturers, it requires less power and since it operates faster (60 R. P. M.) its capacity is therefore greater. The rolls measure 18" wide by 30" in diameter and are equipped with 2" thick, removable, manganese shells. Each roll is supported by two, large SKF, self-aligning, roller bearings, which rotate on heavy stationary shafts. These bearings are located inside the rolls, close to the outer shaft supports to materially reduce shaft load.

All crusher shafts, when operating under load are subject to a certain amount of deflection which if not corrected will cause premature and excess wear or heating; such conditions cannot develop in this crusher because the bearings can never get out of alignment. Two massive screws

(heavy-spring equipped) permit any desired adjustment of rolls and act as safety releases against tramp iron or other uncrushable material. The belt-driven pulley shaft is geared to sprocket countershaft using heavy roller chain to operate the rolls. The chain drive permits a greater variation in the spread of the rolls, hence a greater variation of finished sizes. Gearing, sprockets and chain are fully enclosed with heavy metal guards—Alemite lubrication is used throughout.

New Closed-Back Hand Shovel

A NEW HAND shovel has been announced by The Wood Shovel and Tool Company of Piqua, Ohio. This new shovel is known as the Wood's Closed Back, and, resembles the familiar hollow back type in many ways, although instead of the usual hollow in the back of the blade, a steel plate is welded securely to the blade and extending up into the socket. By this construction, the one-piece steel blade is made smooth both front and back, and yet permits the use of the tapered socket which is heat-treated to provide greater strength and springiness than is offered by a heavy solid shank. Another ad-

Complete information regarding the equipment mentioned on this page may be had by writing the manufacturers. We will appreciate your mentioning EXCAVATING ENGINEER.

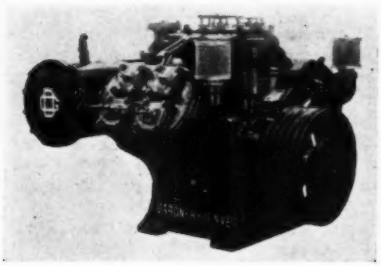
vantage is that, with this type of socket, the lift or bend usually found only in plain back shovels is applied in this new model.

Other features in the Wood's Closed Back shovel are the straight handle and turned shoulder. To replace a handle it is only necessary to push the new handle into position and replace two rivets. The turned shoulder consists of a lapping over of the metal at the top of the blade and the pressing of this double thickness of metal into a sturdy beading which gives greater strength to the frog, eliminates blade splitting, and provides greater foot comfort for workers.

Gardner-Denver Offers Compressor of New Design

ACCORDING to an announcement from Gardner-Denver Company of Quincy, Ill. the company's engineers have developed a new 6-cylinder two-stage water cooled compressor embodying distinctive features which provide more delivered air, with a resultant saving in power cost. An outstanding departure from conventional compressor design is the use of four, small-diameter, low-pressure cylinders, instead of two large ones; this construction permitting the use of small, lightweight pistons and considerably reducing the inertia loads. The use of two pairs of low-pressure, water-cooled cylinders provides lower air temperatures than were previously obtained in small vertical compressors, with corresponding saving in horsepower. By watercooling the cylinder walls, lower wall temperatures are obtained, with better lubrication and longer life. Distortion of cylinder walls from heat is eliminated, and, in addition, the compressor operates independently of atmospheric temperatures. These 6-cylinder compressors, it is stated, adequately meet the need for more compact machines having efficiencies comparable to those of large two-stage horizontal compressors of the same capacity. Mountings include motor mounted on shaft; V-belt to electric motor. Diesel or gasoline engines; or direct connected through flexible flywheel coupling to motor and engines.

Complete information regarding the equipment mentioned on this page may be had by writing the manufacturers. We will appreciate your mentioning EXCAVATING ENGINEER.



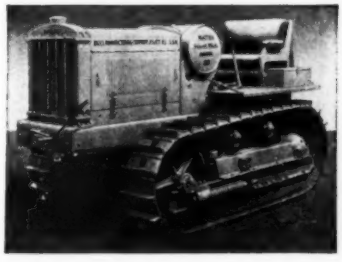
Motor-Driven Grab Bucket

IMPROVED motor driven grab buckets ranging from ½ to 3 cubic yards capacity for steel mills, foundries, power houses and material yards handling ore, limestone, dolomite, slag, sand, cinder, clay, coal, and similar bulk materials are announced by Erie Steel Construction Company, Erie, Pa. Since each bucket carries its own motor, the buckets can be attached to cranes, monorail hoists, or any hoisting equipment at which electric power is available. A Westinghouse crane motor, brake, and gearing are mounted in the bucket head. Either an A.C. or D.C. motor can be used. The coupling between motor and worm gear serves as a braking wheel. All moving parts are lubricated by the forced Alemite system. According to the manufacturer, the bucket has been designed for proper balance, equalization of strain to prevent warpage, and the heavy, plate scoops are reinforced with hardened cutting edges. Special teeth can be attached to the cutting lip for hard material. It is thus a digging device as well as a scoop.

Bates Announces a New Tractor

THE BATES Manufacturing Company of Joliet, Illinois, builders of the Bates Steel Mule, announces a new model 35 tractor which has all the advantages of the old Bates 35 plus many new features.

According to the manufacturer, the improved design of this new tractor provides greater riding comfort, greater steering ease, smoother operation and longer life. The crawler housing supporting the track idlers has been extended to give greater protection to the drive sprocket. The wide track-rail has been retained and greater clearance has been introduced between the truck-wheel flanges and track-rails, assuring longer wear before flange replacement is necessary. The braking pressure of the steering brakes has been increased and the crawler can be stopped with a relatively light pressure of the foot. The standard Bates brake lock is mounted on the left-hand brake pedal. By merely flexing the foot downward the tractor and its load can be held stationary on any hill position the tractor may be in. The new Bates 35 tractor has a drawbar pull of slightly over 43 H.P. and can be powered with either Diesel, oil, or gasoline engines.



SHOTS *from the Firing Line*

Progress Report on Flood Control Work

A REVIEW of the construction work accomplished during the past six months ending December 31, 1934 shows a total of over 52,462,000 yards of earthwork placed in levees. Of this amount over 51,760,000 yards were placed on the main river project below Cape Girardeau, Mo., under section 1 of the flood control act of May 15, 1928, while the remaining 702,000 yards were placed on tributaries and above Cape Girardeau, Mo., on Mississippi River under section 6 of the same act. A total of over 518,516,000 yards have been placed on levees since June 1, 1928, of this amount over 497,762,000 yards were placed under section 1 and 20,754,000 yards under section 6 of the above act.

Work in connection with bank protection was carried on with 21,209 linear feet (4.0 miles) of new revetment being placed from July to December, 1934. Project channel requirements were maintained during the past six months except for a few days during July and August at several locations where slight shoaling took place but was promptly removed. Corrective dredging in connection with cutoffs was under way at several locations on the Mississippi and Atchafalaya Rivers.

Plans and Aims of Bureau of Mines Outlined by New Director

FOLLOWING his confirmation by the Senate as Director of the United States Bureau of Mines, Dr. John W. Finch has briefly outlined certain plans for making the Bureau a more useful agency, not only in connection with the recovery program of the Administration, but also wtih respect to the mineral industries as a whole.

Because of the seriousness of the current economic situation, Director Finch intends for the immediate present to emphasize the activities of the Bureau's Economics Branch, "'which will be reorganized by realignment of facilities within the Bureau of Mines to concentrate the collection and distribution of economic and statistical data pertaining to the mineral industry in its broader aspects and to meet the requirements of the Governments recovery program. . . ."

In discussing work to be resumed as soon as funds can be obtained, Dr. Finch mentioned explosives research, which was responsible for the development of comparatively safe "permissible explosives" for use in coal mines; recommissioning of the 9 mine rescue cars which now stand idle on railroad sidings but which should be placed in service to render aid at mine disasters or to serve as bases of operation for training miners in first aid, in mine rescue and recovery operations, and in safety education; the study of methods of accident prevention, particularly with respect to falls of roof in mines; expansion of first aid training, which has been reduced to about one-half its former activity; and the resumption of studies of health of miners and of sanitation in mining communities.

Air Express Aids Contractors

AIR EXPRESS in the United States scored a gain of more than 100 per cent in the year just past—and the tabulation of these increased shipments reveals many instances wherein this ultra-modern method came to the aid of construction men—and saved thousands of dollars for them in threatened payroll losses.

Records of the United Air Lines, whose 200-mile-an-hour multi-motored passenger planes are the coast-to-coast carriers for the Air Division of the Railway Express Agency, reveal many cases of this kind.

A paver, working on a highway job near Salt Lake City, unobligingly broke down at 4 p.m. A quick inspection revealed a broken casting that could only be replaced from a distributor in San Francisco.

An order was telegraphed to the distributor, who in turn delivered the new part to the Air Division of Railway Express and before daylight the next morning the casting was delivered at the Salt Lake airport. By 8 a.m. it was installed, and the machine was operating at the start of the working day. Thousands of dollars were saved.

Air express was again called to the rescue on the California-Nevada highway near Towle, California. There the breakdown necessitated the rushing of 225 pounds in parts from a Milwaukee manufacturer. The shipment traveled 2,100 miles by air to Reno, and was then rushed out to the job. Two full working days were saved.

Water Power Resources of the United States

REVISED ESTIMATES of the potential water power of the United States prepared by the U. S. Geological Survey, Department of the Interior, place the power available 90 percent of the time at 41,701,000 horsepower and the power available 50 percent of the time at 60,276,000 horsepower.

The ten leading states and their potential power in horsepower available 90 percent of the time are as follows: Washington, 8,800,000; Oregon, 4,400,000; California, 4,120,000; New York, 4,034,000; Arizona, 2,759,000; Idaho, 2,550,000; Montana, 2,410,000; Utah, 1,420,000; Tennessee, 1,340,000, and North Carolina, 916,000.

The total capacity of water wheels installed in water-power plants of 100-horsepower or more in the United States on January 1, 1935, was 16,075,307 horsepower.

On the basis of present practice in the installation of water wheels for the utilization of water-power sites, it is estimated that water wheels having a capacity of about 80,000,000 horsepower would be required to utilize all of the water power in the United States. This represents an installation equal to about twice the potential power available 90 percent of the time and one-third more than the potential power available 50 percent of the time.

Progress on Public Works Highways to March 16, 1935

PROGRESS MADE on emergency construction of public works highways to March 16 under the supervision of the U. S. Bureau of Public Roads shows a total of 587 projects, estimated to cost $21,824,000, approved but contracts not yet awarded; 1,039 projects, estimated to cost $37,973,000, awarded but not yet under construction; 2,728 projects, estimated to cost $161,511,000, under construction; and 7,883 projects completed at a cost of approximately $349,284,000. The 2,728 projects under construction involve 7,439 miles of road and are giving regular direct employment to 73,806 men.

Mexican Tourist Bureau Formed

ANNOUNCEMENT was made recently from the Washington, D. C. offices of Charles M. Upham, Consulting Engineer for the Mexican National Highways, of the formation of the Mexican Auto Tourist Bureau. Jointly sponsoring this with Mr. Upham is Captain John G. Bradley, author of "Into Old Mexico By Auto" and formerly an advertising executive. Plans also include as third member of the firm, a prominent Mexican, whose name was not revealed.

Mr. Upham's career as an international highway engineer and his connection as Engineer-Director of the American Road Builders' Association have made him an outstanding leader in road matters. His work on the Mexico City-Laredo Highway has been particularly noteworthy. He has shar-

The *new* Koehring Wheel Dumptor 70-5

for hauling • dumping • spreading • • • •

20 miles per hour

The new 5 yard KOEHRING WHEEL DUMPTOR is the modern *high-speed* self-contained load carrying tractor. *Twenty miles* per hour, either forward or reverse. This high travel *speed*, with *speed* at the loading point and *speed* at the dump, establishes the 70-5 Dumptor as the outstanding *high speed*, economical tractor-type dirt moving unit.

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Shots From the Firing Line—*Continued*

ed the confidence of Mexican officials and private citizens alike, has helped train their engineers, and has counseled with them at every step in their monumental work now nearing completion.

In explaining his interest in the Mexican Auto Tourist Bureau, Mr. Upham said, "Having helped to build this road, my next concern is to help make it pay dividends in happiness, friendships, and better trade relations between the two republics. And I know of no better way to do this than to render a real service to those who contemplate an automobile trip into Old Mexico."

Dover Dam to be Let in April

THE U. S. ENGINEERS office at Zanesville, Ohio, advises that bids will be received about April 23 for the construction of Dover Dam. This dam is one of several included in the flood control and water conservation program of the Muskingum Watershed Conservancy District. The dam is located in Tuscarawas County, Ohio, about three miles northeast of Dover. Construction will be of the massive concrete straight-gravity type. The dam will have a top length of approximately 820 feet and maximum height of approximately 80 feet above foundation rock. The principal items of work involved are: 112,000 yards of earth excavation; 37,000 yards of rock excavation; and 102,000 yards of concrete. Full particulars can be obtained by writing the Engineers office at Zanesville.

Plans for Flood Control Outlined

CONTINUATION of large scale earthwork construction in the Lower Mississippi Valley for an indefinite period of time will result if Congress adopts a report submitted in February by Maj. Gen. E. M. Markham, Chief of Engineers, recommending revisions of the Jadwin plan to cost $313,000,000. The Markham plan has been approved by President Roosevelt and Secretary of War Dern.

Inclusion of three huge new flood control projects in a single Congressional bill—the Tensas Basin floodway to cost $110,000,000, the Yazoo Basin levee and reservoir plan to cost $50,000,000, and the St. Francis River levee system to cost $16,000,000—and the apparent divorcement of these projects from the work-relief bill, undoubtedly means that the Corps of Engineers will utilize the dependable and economical contract system in constructing the projects. It is estimated unofficially that the three projects will involve approximately 350,000,000 cubic yards of earthwork.

Work on Casper-Alcova Project to be Resumed

SECRETARY of the Interior H. L. Ickes recently approved a revised program for construction by the Reclamation Bureau of the Casper-Alcova project in Wyoming. Under the new plans the irrigation development which would have cost $23,701,235 will cost $20,004,254, a net reduction of $3,696,981.

A PWA allotment of $12,000,000 has been made to start construction of the project.

Under the revised program the first unit of the project will consist of 35,000 acres which the engineers agree can be adequately irrigated with waters obtained from the Seminoe reservoir. The proposal now is to construct the main canal only far enough to irrigate 35,000 acres but of a size so that the entire area of 66,000 acres can eventually be irrigated if it is found that sufficient water is available as claimed by some engineers and by the State authorities. A reservoir having a storage capacity of 1,040,000 acre-feet to hold flood water and to conserve water passing down the river in non-irrigation months is included in the program.

Employees Must be Paid for Work Interruptions Beyond Their Control

EMPLOYEES in coded industrial establishments must be paid for interruptions of work beyond their control when an employer requires them to be present and ready for work, under provisions of an administrative order announced by the National Industrial Recovery Board December 27, 1934.

The order lists causes of interruptions to work over which, presumably, employees have no control. They are:

Breakdowns, delays, time spent waiting for materials or waiting for the loading or unloading of railroad cars or other vehicles of transportation, and interruptions in activity due to other causes.

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For Used Equipment
see
Excavating Engineer

For Sale and Bargain Counter Section
(Pages 204-205 and 208-211)

Beach City Dam Bids Opened

WM. EISENBERG & Sons, Inc., Camden, New Jersey was low February 21 with a bid of $843,514 for the construction of Beach City Dam in Sugar Creek near Beach City, Ohio.

The construction of this earth-fill dam will involve 475,000 yards of common excavation; 728,000 yards of borrow; 146,000 yards of rock excavation; and the placing of 31,000 yards of concrete.

Mohicanville Dam to be Let in April

THE U. S. ENGINEER'S office at Zanesville, Ohio, will receive bids about April 19 for the construction of the Mohicanville Dam which will be located on the Lake Fork of the Mohican River about two miles east of Mohicanville, Ohio. The dam will be of the rolled-fill type with the central section of impervious material, and outer upstream and downstream sections of dumped-rock fill. The dam will be about 1,200 feet in length at its crest and will have a maximum height above the river bed of about 40 feet. The principal items of work involved include: 325,000 yards of earth, 24,000 yards of rock excavation, and 67,000 yards of borrow. Complete details of the project and the exact date of the letting can be had by writing the Engineer's office at Zanesville.

Mohawk Dam Bids Opened

GEORGE M. BREWSTER, INC. of Bogota, New Jersey, submitted low bid of $1,720,664, March 19, for the construction of Mohawk Dam near Warsaw, Ohio.

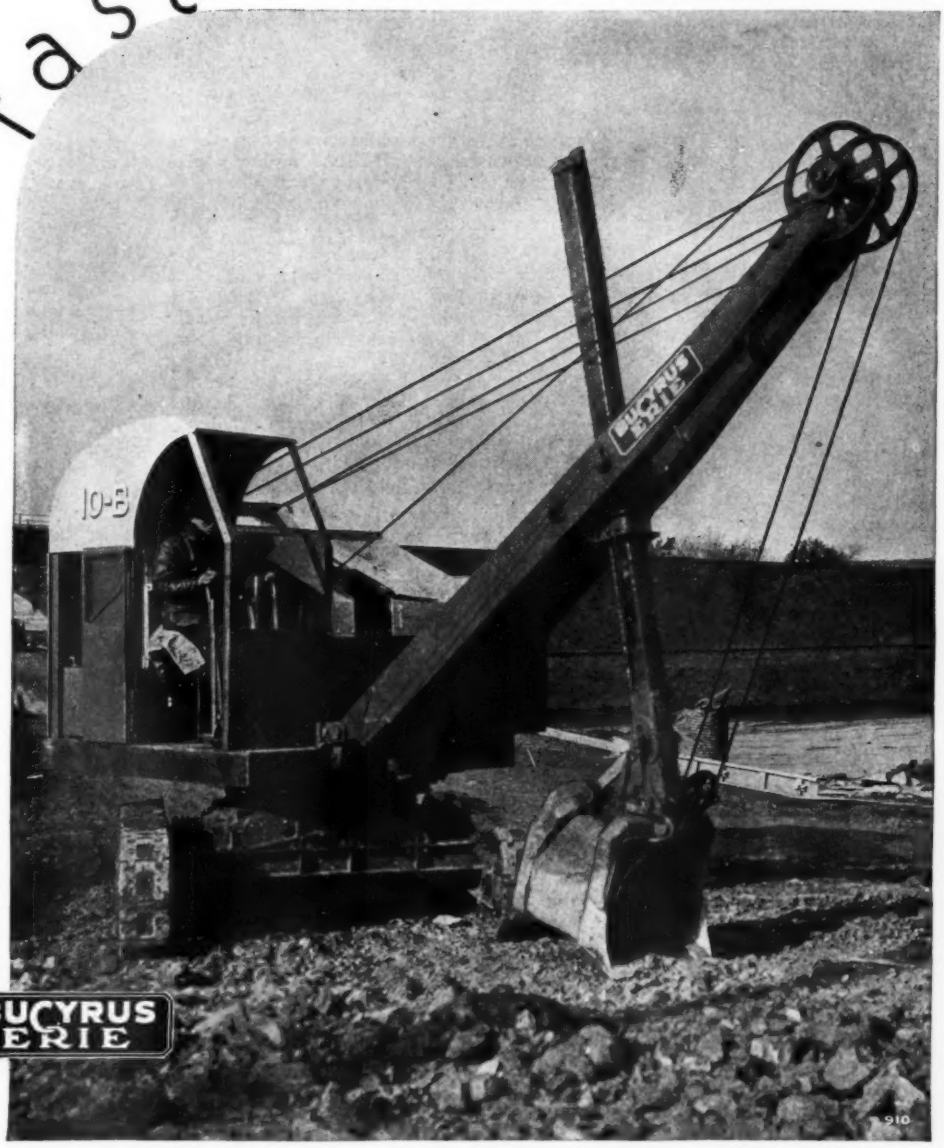
Foreign Notes

Hawaii

Here are two good dirt movers. Operators James Crockett and Ray Davies wrote us from Hawaii saying the Bucyrus-Erie Gas+Air shovel arrived safely at Port Allen and is doing an excellent job for the **Hawaiian Dredging Company.** The snapshot shows the shovel loaded on a trailer enroute to the dock in San Francisco harbor for loading on S. S. "Manulaui".

5 CYCLES a minute in most digging is nothing unusual for the 10-B. So sure and easy to handle are the controls that the operator can maintain top speed hour after hour. This full-revolving ⅜-yard machine travels up to 4¼ miles per hour, hustles up grades even steeper than 30%, and "turns on a dime" at full speed. A light, pneumatic-tired trailer is available. The 10-B is outstanding in modern high-speed performance; put it on your jobs today.

fast



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Shots From the Firing Line— *Continued*

New England Notes

Bernard J. Dolan recently completed a 3,000-yard grading job near Danbury. Shown in the adjoining column is his Bucyrus-Erie 16-B gasoline shovel loading dirt to Mack trucks with George Fannon at the levers.

C. C. Goeppler of Wilton, Connecticut, recently completed a drainage ditch near Westport. The accompanying illustration shows his Bucyrus-Erie 10-B shovel working in extremely close quarters. Casting to either side, Operator Marchall Whittlesey was able to move about 2 yards per minute with this fast machine.

New York Notes

By G. E. PETERSON

The annual dinner of the **Westchester County Contractors Association** was held at Murry's Inn on the Bronx River Parkway on March 11th. There were about 650 present and everyone reported a very enjoyable evening consisting of an excellent dinner followed by several acts of high class entertainment. Dominick Luciano of the Tuckahoe Construction Company is President of the Association.

Low bidders at the recent State Highway letting were announced as follows: **Peckham Roads Construction Company**, White Plains, $14,298, for 2.08 miles 18' gravel in Greene County; **Sante DeMichiel**, Schenectady, $23,123, for 2.88 miles of 18' gravel in Greene County; **L. E. Cleghorn**, Rochester, $13,814, for .32 miles of 20' macadam in Steuben County; **John Petrossi & Sons Construction Company**, Rochester, $36,255, for bridge and approaches in Steuben County; **McLain Construction Corporation**, Buffalo, $55,726, for bridge in Niagara County; and **A. D'Angelo Sons Company**, Bronx, New York, $226,781, for overhead bridge and approaches in Bronx County. This job includes 143,000 yards of excavation.

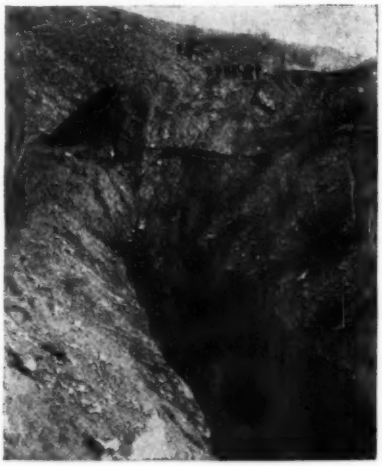
The state highway budget has been approved for the 1935 highway program and calls for an **expenditure of $16,000,000** for new construction and maintenance.

Metropolitan area low bids have been as follows: **The Four Contracting Company**, New York City, $71,000, for water mains at Rockaway Beach; **Luang Construction Company**, New York City, $97,305, for sewers at Sheepshead Bay; **Bersin Engineering Corporation**, New York City, $353,700, for bridge over Wallabout Canal in Brooklyn; **Faircroft Engineering Corporation**, New York City, $734,326, for 8 grade crossing eliminations on the Long Island Railroad—the excavation will be handled by the **Bernheim Contracting Company** of Brooklyn and the yardage is about 400,000 yards; **P. Tomasetti**, New York City $231,000, for water mains in Long Island City and $271,208 for sewage disposal plant at Kings Park, Long Island; and **North Eastern Construction Company**, New York City, $1,179,701, for sewage treatment works at Coney Island.

Pennsylvania Notes

A quarry shot which is stated to be the last word in safety and certainly is completely new as far as the explosives industry is concerned, took place at the **Giant Portland Cement Company's** quarry at Egypt, on Wednesday, March 6. This shot demonstrated the safety features of the new Du Pont safety blasting agent, Nitramon, recently brought out by the manufacturers. Two of the blast holes were loaded with Nitramon and a can of TNT was used as a primer. To the TNT was attached a 300-foot length of Cordeau with an electric blasting cap on the end. The value of the new blasting agent lies in the fact that every phase of the work was carried out with the least sensitive explosive now known with the exception of course of the blasting cap which was 300 feet away. The results of the shot were excellent both from the view of quarry operators and from that of explosives men. Additional holes at the quarry were detonated by means of a dynamite cartridge used on top of the Nitramon. About 11,000 pounds of this explosive were used in the entire operation, producing about 55,000 tons of well broken stone and at a very substantial saving in cost over what would have been incurred had the regular dynamite been employed.

Looking at this snapshot, taken on a coal stripping project near Coaldale, we might say the truck is "down and out." Fortunately no one was injured when the truck, in backing up to dump its load, got too close to the edge of the hole and kept right on going. The driver jumped out just in time to escape being carried down with it.



North Carolina Notes

Low bidders at a recent highway letting were: **E. W. Grannis**, Fayetteville, $20,964 for a grading project in Scotland County and $42,207 for a 7.9 mile grading and surfacing project in Wilson County; and **Gregory-Chandler Co., Inc.**, Virgilina, Va., $37,805 for 9 miles of grading in Warren-Halifax Counties.

"SHE'LL PAY FOR HERSELF ON THIS JOB!"

AUSTIN-WESTERN No. 11 GRADER

REPORTING HOW PHILLIPI BROS., MINNEAPOLIS CONTRACTORS, FEEL ABOUT THEIR INVESTMENT IN A No. 11 GRADER, AFTER OPERATING OTHER TYPES

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"It seems to handle lots more dirt easier than anything we've ever had. We had a ——— 12-foot on the job while we were waiting for yours, and I never realized there could be that amount of difference in a grader. I've been under the impression that a blade is something made to push dirt around that is hung from a frame on wheels but the Austin-Western changed my mind after seeing it work. There isn't a doubt in my mind that she'll pay for herself on this job."

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Shots From the Firing Line— *Continued*

Ohio Notes

Ohio is actively engaged in **roadside beautification.** During the winter of 1933-34 a definite program under CWA was carried on, totaling close to $100,000. In addition there were many smaller CWA projects, such as ditch elimination, seeding and other phases of work, preliminary to actual landscape planting. During the spring of 1934 a state fund of $100,000 was appropriated and was spent on a force-account basis, the money being divided equally among the 12 highway divisions throughout the state. In spite of the extreme drought conditions excellent progress was made and the average loss, according to D. D. Dupre, State Highway Landscape Architect, did not exceed 10 per cent, a remarkable record in view of the fact that losses averaged 5 per cent or better on private landscaped grounds under the best of conditions. Part of a Federal grant of $78,000 for landscaping was spent during the fall of 1934, and the remainder will be spent during the spring planting season of 1935. At the same time contracts totalling $35,000 of state funds are being put into operation.

By H. F. UNGER

Presenting an inventory of nearly $40,000,000 worth of prospective work, Cuyahoga County engineers told the Board of Commissioners that any part of the program selected would have to be financed one hundred per cent by Federal funds. Included in the projects are many excavating jobs: 31 grade crossing eliminations to cost $13,830,000; repairs and reconstruction on 47 county bridges, to cost $10,382,500; re paving and improvements to 49 county roads to cost $1,600,000; a new county administration building of five stories and basement, 108x280 feet to cost $1,615,000; 22 major projects on state highways, including a new route for Lake Shore boulevard and widening of Bulkley boulevard to cost $6,507,000; four or five large sewage disposal projects intended to end contamination of Lake Erie and Rocky River; and finally the construction of a $6,000,000 Main avenue bridge.

The Federal Government has been urged to improve and maintain Black River at Lorain, by L. C. Sabin, Vice-President of the Lake Carriers' Association, at a public hearing at Lorain. Reports were read at the meeting of a previous request for government financing to dredge the river to a depth of twenty-five feet, widen two bends and provide a turning basin at the head of navigation.

A public works list totaling $44,667,000 will be offered by Mahoning County for the national inventory of work projects being compiled for PWA. The Beaver-Mahoning Canal, estimated at $37,000,000, and the $2,100,000 Erie grade crossing program accounts for most of the total. Other major items on the city's "ten year program" include widening, opening and straightening traffic arteries, a new Mahoning River bridge and sixty miles of highway improvement. Funds will also be sought for a new Cedar Street bridge.

FRANKLIN MOELLER

Franklin Moeller, 70, manager of the New York office of the Wellman Engineering Co. of Cleveland was injured fatally in an automobile accident near Stroudsburg, Pa. Mr. Moeller lived in Cleveland from 1900 to 1927 and had been connected with the old firm of Wellman-Seaver-Morgan Engineering Co., which later became the Wellman Engineering Co. He was a member of the American Society of Mechanical Engineers and the American Institute of Mining Engineers. He is survived by a son and two daughters.

THEODORE SCHMITT

Theodore Schmitt, 74, architect, who drew the plans for many of Cleveland's public and business buildings died at his home in Lakewood. He was also interested in excavating. He was the co-founder of the firm of Lehman-Schmitt, of which he was president when he died. He is survived by his wife, a son, a brother, and a sister.

Contracts for the paving of Lee road and Schaaf road **will be soon awarded** by the State Highway Department. Lee road will be paved and widened between Broadway and Miles avenue, a stretch of nearly two miles, at an expenditure of $256,832. Schaaf road will be landscaped and paved for over half a mile west of Brecksville road at an estimated cost of $135,905.

At Wellsville, in Columbiana County, officials of the **Sterling China Co.** announced a $175,000 expansion program. Two tunnel kilns, a new office building and factory additions are to be erected. Excavating contracts will be out soon.

A permit for a storage addition to **Steel & Tubes Inc.** at 224 East 131st street, Cleveland has been granted. A handsome excavating contract, as a result, is in the offing.

Michigan Notes

The following awards were announced by the State Highway Department: **West Michigan Construction Co.,** South Haven, $90,375, for 1.456 miles of grading and concrete paving in Calhoun County; **T. McNally,** Saginaw, $76,533, for 2.515 miles grading and concrete surfacing in Clare County; **Hersey Gravel Co.,** Hersey, $49,826, for 1.032 miles grading and concrete surfacing in Mason County; **R. D. Baker Co.,** Royal Oak, $136,841, for 10.542 miles grading and concrete surfacing in Monroe County, and $74,782 for 5.108 miles grading and draining structure in Jackson County; **E. B. Schwaderer,** Cass City, $59,206, for 3.698 miles grading and draining in Washtenaw County; **Lewis-Frisinger Co.,** Ann Arbor, $92,329, for 7.349 miles grading and concrete surfacing in Jackson County; **Detroit Asphalt Paving Co.,** Detroit, $59,000, for 3.479 miles of road work in Luce County; **C. G. Bridges, Escanaba,** $91,581, for 3.447 miles of grading, draining and 2-course gravel surfacing in Luce County; **Delta Contracting Co.,** Escanaba, $90,978, for 4.107 miles concrete paving in Delta County.

By H. F. UNGER

A PWA project calling for the building of **$200,000,000 state-wide water supply systems** with reservoirs at Gaylord and radiating pipelines to all parts of the state will be submitted to Washington PWA officials by the State Planning Commission.

Plans for a **$14,610,080 sewage disposal and water purification project** for the Detroit metropolitan area were submitted to the State Planning Commission by the State Metropolitan Sewerage and Water Commission. The proposal, prepared by the engineering firm of Hubbell, Hartgering & Roth, Inc. recommended that uniform wholesale water rates should be adopted. The sewage collection and treatment plan could be accomplished by the construction of the following:

1—The Wayne County Sewage Collection and Treatment plan. 2—The construction of intercepters in Oakland County with connection to the Wayne County plan. 3—The construction of intercepters in Macomb County, extending along Lake St. Clair as far as Mt. Clemens and Selfridge Field. The plans also call for the water supply and sewage treatment in the St. Clair River district and the water intake extensions at Wyandotte and Trenton. The plan states that if money for the whole project cannot be obtained, a deferred

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Shots From the Firing Line— *Continued*

construction program should be adopted on the basis of an initial appropriation of $13,040,000 for the Wayne County project, $720,000 for the Oakland County extensions, and $850,000 for the Macomb County extensions including Mt. Clemens.

Wisconsin Notes

Shown here is the portable gravel plant owned and operated by the **Columbia County Highway Department** for producing the necessary crushed stone used on the county highways. The pit is located near Wyocena. This plant is 100% Austin-Western equipped. The Austin-Badger shovel loads the gravel to the grizzly which eliminates the oversize. The remainder falls through to the portable conveyor and is carried to the portable crushing plant. This plant is stated to have an output of approximately 100 yards of crushed material per hour.

Illinois Notes

By A. J. KOENIG

Suburban Paving and Improvement Co. has been awarded a $150,524 contract for 4.23 miles of paving in DuPage County.

Contract for the substructure of a highway bridge at Macoupin was awarded to **D. A. Chernus Const. Co.** of St. Louis. The contract for superstructure was awarded to **Clinton Bridge Works** of Clinton, Iowa.

Hoeffken Bros. have a contract for a bridge on route 161, St. Clair County. **Frandson Bros.**, Chicago have contract for grading 0.74 miles on this route.

H. H. Hall Const. Co. has contracts for two bridges in Clinton and Washington Counties.

Illinois Hydraulic Stone & Construction Company has contract for a reinforced concrete highway bridge at Carpenterville.

Contract for 1.43 miles concrete paving was awarded to **F. C. Feutz** at Carlyle.

Condon - Cunningham - Lemon Company has contract for a 3-span I-Beam bridge in Knox County.

St. Louis and Vicinity

By A. J. KOENIG

The U. S. Engineers will receive bids about April 1st, for the **construction of Dam No. 26** at Alton. The work will include: 30 taintor gates and 3 roller gates; 1,816 lin. ft. cofferdam; 106,500 yards excavation; 356,500 yards of fill; 230,000 sq. ft. sheet piling; 372,200 lin. ft. round timber piling; 45,800 yards stone work; reinforcing steel and structural steel; and gate operating machinery.

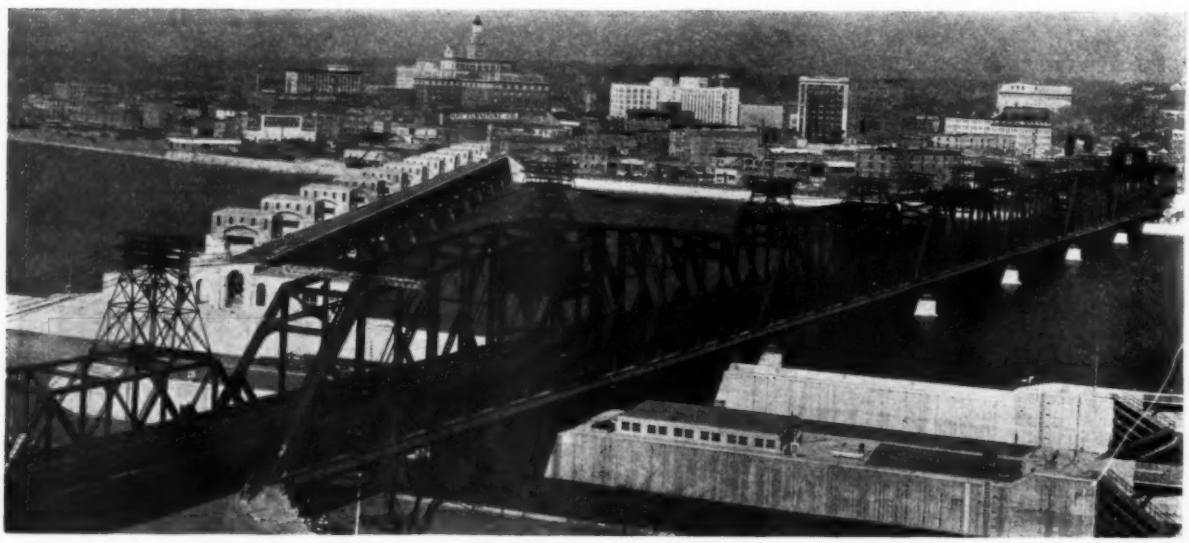
An allotment of $1,103,000 by P.W.A. insures the completion of the approaches to the municipal bridge across the Mississippi River.

The trustees of the Missouri Pacific Railroad Company have been authorized by the Federal Court to make expenditures aggregating **$5,584,603 for improvements** this year.

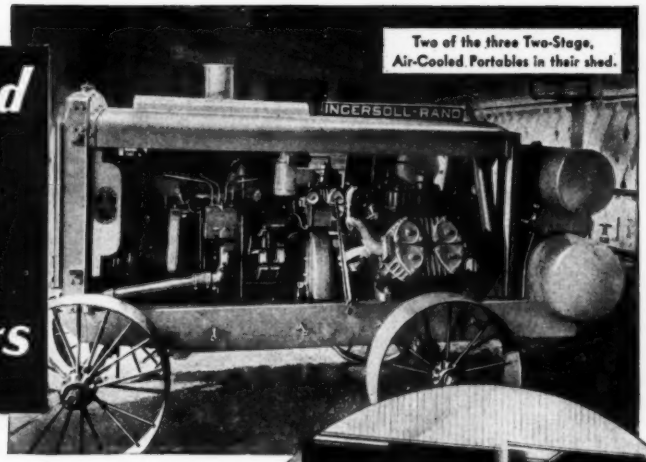
River Notes

Rock Island District

Through the courtesy of Westinghouse Electric and Mfg. Co., we show here a general view of Lock and Dam No. 15 on the Mississippi River at Rock Island as seen from top of Clock Tower, Arsenal, looking across river toward Davenport. Dam consists of 11 roller gates with 100 feet clear opening; the two end gates have a damming height of 21¾ feet and act as sluice ways for sluicing out ice or drift; the intermediate gates have a damming height of 26 feet. Gates are raised at a speed of 6 inches per minute, requiring 55 minutes to completely open them. **S. A. Healy** of Detroit was general contractor on the dam, subleting portions of the work to Central States Engineering Company and to S. Morgan Smith Company, the latter furnishing the roller dam gates. The locks, in the foreground, were built by **Merritt, Chapman, and Whitney Corporation** of Duluth and Chicago.



3 Ingersoll-Rand Two-Stage Air-Cooled Portable Compressors



Two of the three Two-Stage, Air-Cooled Portables in their shed.

Two of the I-R wagon drills.

on this "Hairpin" Elimination Job

257,058 cubic yards of rock are being excavated and a 318,000-cubic-yard fill is being made in a single mile of road (near Wilkes-Barre, Pa.) to do away with several highly-dangerous curves and grades. The job includes a cut 110 feet deep — a fill 120 feet high.

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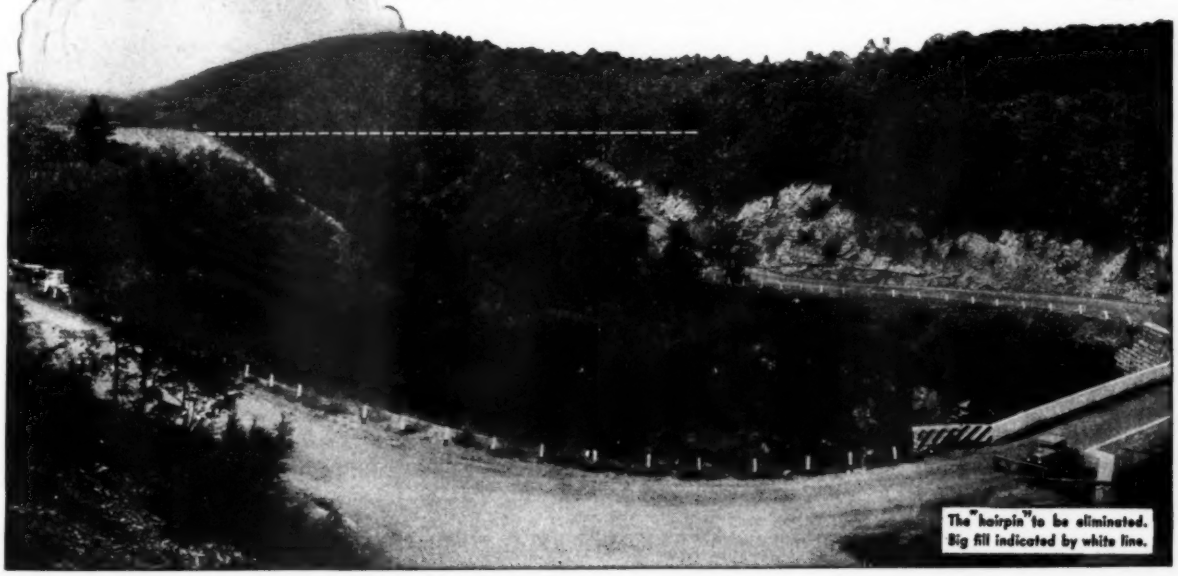
The "hairpin" to be eliminated. Big fill indicated by white line.

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Shots From the Firing Line—*Continued*

New Orleans District

McWilliams Dredging Company, New Orleans, submitted low bid March 8 of 8.16c per yard for dredging 7,200,000 yards in the Lake Mongoulois Channel in the Atchafalaya Basin.

Vicksburg District

The U. S. Engineers will receive bids April 16 for constructing approximately **221,000 yards of levee** on the west bank of the Ouachita River. The work is located near the city of West Monroe, Louisiana.

Mississippi Notes

By L. GABEL

The State Highway Commission has awarded the following contracts: **Barber Brothers Construction Company**, Baton Rouge, $26,666, for 1.191 miles grading, drainage structures and paving in Jefferson County; **H. A. Russell**, of Pontotoc, $7,001, for work on the Shelby-Perthshire road in Bolivia County; **Pigford Brothers**, and **Shuptrine Company**, of Meridian, $93,354, for road and bridge construction in Rankin and Scott Counties.

Action was deferred and contract not awarded on road and bridge construction on the Magee-Mendenhall road in Simpson County but **Gerald Smith** of Memphis was low with a bid of $87,679.

A. G. Seifried, of Baton Rouge was low with a bid of $5,546 for a highway beautification project in Pike County.

Texas Notes

There appears to be no end to the variety of uses to which an excavating machine can be put. The accompanying illustrations show a 1¼-yard Diesel dragline at work on a job which at least is new to us. The combination of a bumper grapefruit crop and a heavy frost resulted in the spoiling of a lot of fruit which had not yet been picked.

Government regulations required that this spoiled fruit be covered up to prevent fruit-fly infestation and in order to do the job quickly enough it was necessary to bring in the dragline to speed the work. Seeing all this fruit being handled so recklessly certainly made our mouth water.

Oklahoma Notes

By L. GABEL

Apparent low bidders on three highway projects have been announced by the Highway Commission: **Hyde Construction Company**, Enid, $14,510, for grading, drainage, and paving 0.512 miles State Highway No. 18 near Ralston in Pawnee-Osage Counties, and two bridges on State Highway No. 35 about 1.75 miles from Hardesty, Oklahoma in Texas County; and **Ryan-Richards Company**, Oklahoma City, $89,607, for 5.205 miles asphalt paving on U. S. Highway No. 70 in Stephens County.

Missouri Notes

By L. GABEL

The State Highway Commission, in its biennial report, has disclosed plans for making a survey to determine its future course in highway construction. The study, to include a comprehensive traffic survey of the entire highway system, and the determination of the highway needs from a business, agricultural, social, economic, and transportation standpoint, will be completed

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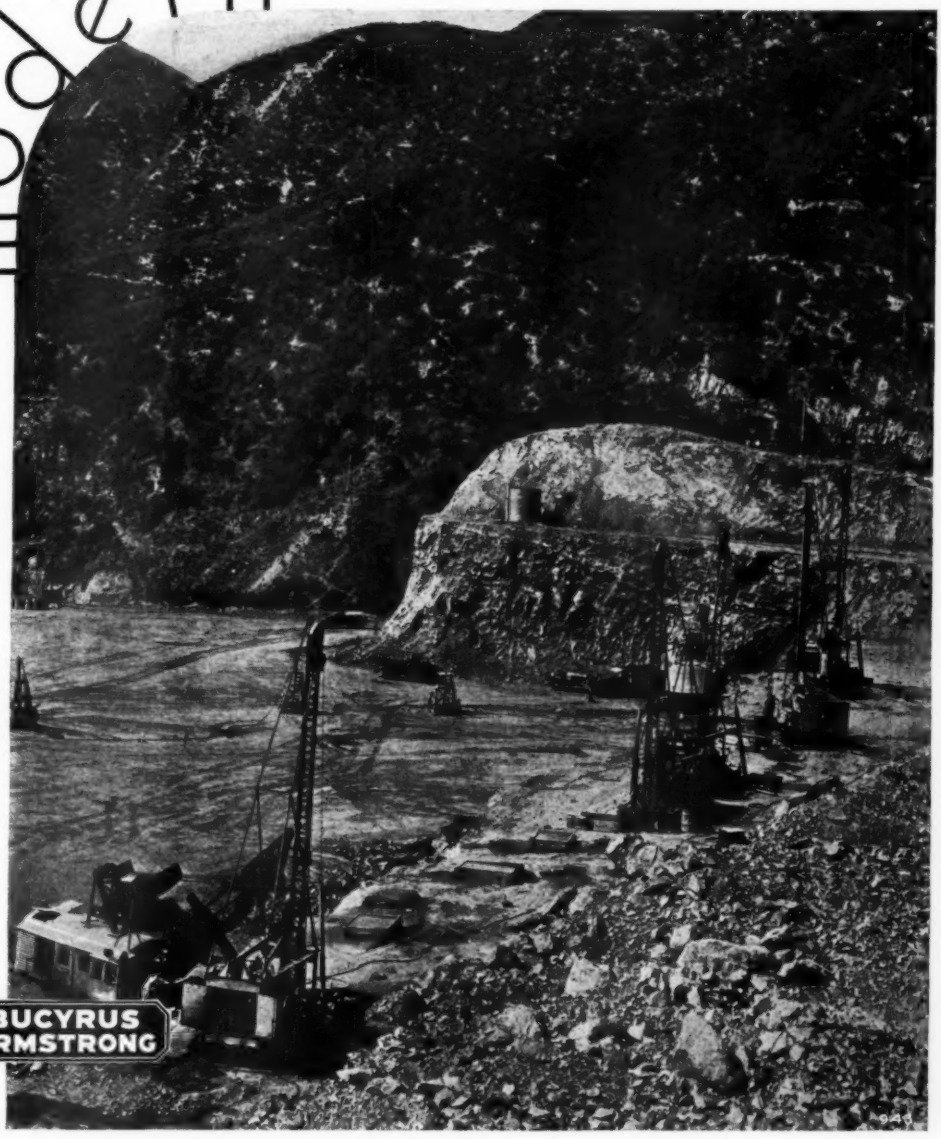

BUCYRUS-ERIE

EXCAVATING, DRILLING, AND MATERIAL-HANDLING EQUIPMENT...SOUTH MILWAUKEE, WISCONSIN

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Shots From the Firing Line—*Continued*

before the 1937 legislature convenes. Since the creation of the State Highway Commission, construction of 12,492 miles of the 16,268-mile system has been completed at a total cost of $264,632,739. The Commission expects to spend **$12,647,006 on highway and bridge construction this year**, and $10,347,500 in 1936. During the 1933-34 biennium, $30,353,913 was spent on the construction of 7,316 miles of new highways and roads, and $4,934,767 for bridges. During this two year period, the following types of highways and roads were built: 3,104 miles of graded earth, costing $13,497,297; 1,737 miles of gravel surfacing, costing $2,310,435; 1,007 miles of other aggregate surfaces at $986,239; 666 miles of bituminous surfacing at $2,342,739; 283 miles of 20-foot wide concrete pavement costing $7,188,084; 205 miles of concrete pavement at miscellaneous widths at $3,919,224; and 316 miles of miscellaneous road construction at $109,895.

Nebraska Notes

Central Bridge & Construction Co. and Allied Contractors, Inc., Wahoo, were low with a bid of $182,594 for channel excavation and structures, including 1,800,000 yards dry excavation, for the Platte Valley Power & Irrigation District at North Platte.

Colorado Notes

By H. M. BIBAUD

A. H. Reed, Cheyenne, submitted low bid of $187,530 for 20 miles of oil-mix surfacing on the Grand Loop Highway over Dunraven Pass in Yellowstone National Park.

W. A. Bechtel Co., San Francisco, **Utah Construction Co.**, Ogden, and **Morrison-Knudsen Co.**, Salt Lake City, submitted joint low bid, February 18, of $798,078 for the construction of Taylor Park Dam (earth and rock fill type). Their alternative bid was $784,742 for a concrete arch type dam. This is a part of the Uncompahgre irrigation project in Delta and Montrose Counties.

Work started February 15 on the 6-mile Moffatt Pioneer Tunnel water diversion project. It is expected the work will be completed in April 1936. Water will be brought through the tunnel to replace water which now flows out of Platte Canon and is used in irrigation ditches below Denver.

Engineers of the State Highway Department, who were recently engaged in making a survey of the road between Montrose and Ouray, receive encouragement from the announcement that the Federal Government expects to spend several hundred million dollars to **eliminate railroad crossings.**

South Dakota Notes

Construction of the new $560,000 addition to the Washington High School in Sioux Falls was started late in December when **Michael Fanebust** brought in his Bucyrus-Erie 16-B shovel to excavate the basement. Although considerable frost was encountered he had no trouble digging and made short work of moving 9,000 yards. The shovel, shown above, loaded to 4-yard trucks. 25 eight-hour days were required to complete the general excavation. Work stopped until March, because of cold weather, when the balance of the footings and heating tunnels, involving 3,000 yards, were completed with the shovel. Shown below, the shovel loads a 4½-ton cannon to a truck which hauled it to one of the city parks where it was set up. Henry Carlson Company had the general contract for the construction of the new addition, subletting the excavation to Michael Fanebust.

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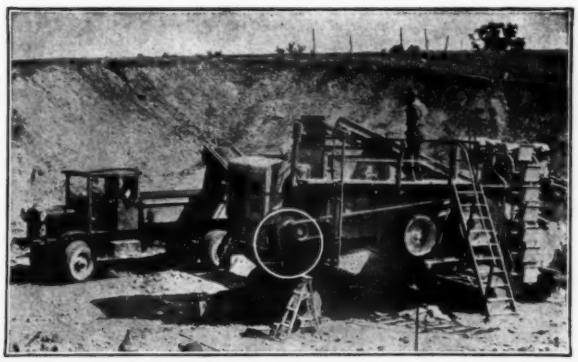

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Fort Peck Dam Notes

In the face of difficult weather conditions of virtual blizzard proportions on several days, considerable construction work was done during the week of March 5-11. **The Massman Construction Co.** continued dirt-moving operations at the spillway every day of the week and succeeded in moving 187,000 cubic yards. Although much trouble was encountered from the dirt sticking to the bottoms of the trucks, 32,000 cubic yards were moved on Sunday, March 10th. Ten new trucks have been received and placed in service.

Weather conditions have little effect on tunnelling operations and the **Mason & Walsh Co.** completed a total of 1,087 feet in the four pilot tunnels for the week ending Monday, March 11th. All of the tunnels are now being driven on curves leading to the outlet portals. Due to the curves and the distances from the portals to the headings, progress has been somewhat slower than during previous weeks. No. 1 tunnel has advanced 4,473 feet from the entrance; No. 2—4,674 feet; No. 3—5,193 feet; and No. 4—5,612 feet.

Employment figures for the project continue to **show an increase** for each bi-monthly period. The latest figures compiled indicate that at the end of February there were 5,359 persons at work, a net increase of 37 over the total number employed February 15.

Washington Notes

By C. M. LITTELJOHN

The **Chelan County Commissioners** recently purchased two power shovels which will be used for removing snow slides over the Lake Chelan roads. Later on they will be used on road construction work in anticipation of a large amount of summer tourist traffic.

W. H. Latta is using a ¾-yard shovel at his placer mine near the Keller ferry. His washing plant has a capacity of 400 yards of gold-bearing gravel per shift.

Grand Coulee Dam Notes

By GRACE KIRKPATRICK

The west bank cofferdam, shown above is expected to be completed by April 15. During the past month **Mason-Walsh-Atkinson-Kier** have added an additional 1,500 feet of conveyor to their already extensive system. The total yardage moved during February was 907,554 of which 863,219 was moved by the conveyor. Up to and including February 28 the total yardage moved was reported as 2,294,228, of which 1,795,568 was handled by the conveyor system.

California Notes

By H. L. LIVINGSTON

The following contracts have been awarded by the Division of Highways:

J. L. McClain, Los Angeles, $48,389, for .8 miles grading and paving in Los Angeles County; **J. E. Haddock**, Los Angeles, $123,729, for 1.1 miles grading and concrete paving in Orange County; **Los Angeles Paving Co.**, Los Angeles, $111,222, for 3.4 miles grading and paving in Los Angeles County; **Sully Miller Contracting Co.**, Long Beach, $56,150, for .7 miles grading and paving in Los Angeles County; and **L. A. Brisco**, Arroyo Grande, $19,623, for bituminous surfacing on 6.1 miles of highway in Tulare County.

The Pacific Bridge Company, San Francisco, were low with a bid of $698,226 to the Public Utilities Commission, San Francisco, for constructing a 2,800-foot double 54" submarine pipeline across the southerly arm of San Francisco Bay, and for a 435-foot single 54" pipeline across Newark Slough.

Bids will shortly be received by the Bureau of Reclamation at Denver, Colorado, for 21 miles of All-American Canal construction. This work involves **12 million cubic yards of common excavation.** In addition to this work, bids will shortly be called for for the Canal section between the diversion dam and the Laguna Dam, and also on three large concrete siphons.

The City Engineer of Santa Monica, is preparing plans and specifications for the **construction of the Colorado Avenue trunk sewer.** An application will be made to PWA for funds. The estimated cost of material for this job is $200,000.

The Orange County Flood Control Department is preparing tentative plans for **flood conservation and control work** along the Santa Anna River. This work will consist of sloping cement dikes on both sides of the river and widening the river channel to 1,200 feet. The estimated cost of this work is $3,000,000.

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All-American Canal Notes

Shown above are W. E. Callahan Construction Company's 10-W and 6-W Bucyrus-Monighan draglines at work near Laguna Dam. The 10-W in the foreground carries a 12-yard bucket.

Colorado River Aqueduct Notes

By K. CAMPBELL

Following the suspension of Wenzel and Henoch's contract on the San Jacinto bore, and the taking over of the work by the Metropolitan Water District, the directors of that body have selected a board of four nationally known consulting engineers to report on the job. Members of the board are: Thaddeus Merriman, for many years chief engineer of the New York City Board of Water Supply; D. H. Reddinger, of the Southern California Edison Company in Los Angeles; W. R. Fontaine, of San Francisco, consulting engineer for Six Companies on Boulder and Parker Dams; and J. F. Johnson, of Salt Lake City, consulting engineer for the U. S. Bureau of Mines.

Bennett and Taylor, Los Angeles, have been awarded a $79,476 contract for the construction of 16 miles of road through the Whipple Mountain district near the Colorado River.

A number of tunnels have now reached completion. Among these are: Whitewater tunnels No. 1 and No. 2 driven by **West Construction Company;** Mecca Pass tunnels No. 1, No. 2, and No. 3, driven by **Morrison and Knudsen;** Copper Basin tunnel No. 1 and No. 2, driven by **Walsh Construction Company;** Hayfield No. 2, driven by **Shofner and Gordon;** Wide Canyon No. 2 and Thousand Palms No. 2 driven by the crews of the District.

L. E. Dixon, Bent Brothers and Johnson, contractors on the 2½-mile Pasadena supply tunnel have driven several hundred feet since excavation was started on February 21.

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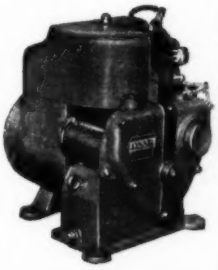

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Not in the Contract

Timekeeper: "I am very sorry to hear of your partner's death. Would you like me to take his place?"

Contractor: "Very much, if you can get the undertaker to arrange it."

Minister: "Rastus, don't you know it's wrong to play cards on the Sabbath?"

Rastus: "Yes, parson, an believe me, Ah's payin' fo' mah sins."

Sappy: "I ran into another car last week and was knocked senseless."

Girl: "How long does the doctor think it will be before you'll be all right?"

Nit: "Do you work in the shirt factory?"

Wit: "Yes."

Nit: "Why aren't you working today?"

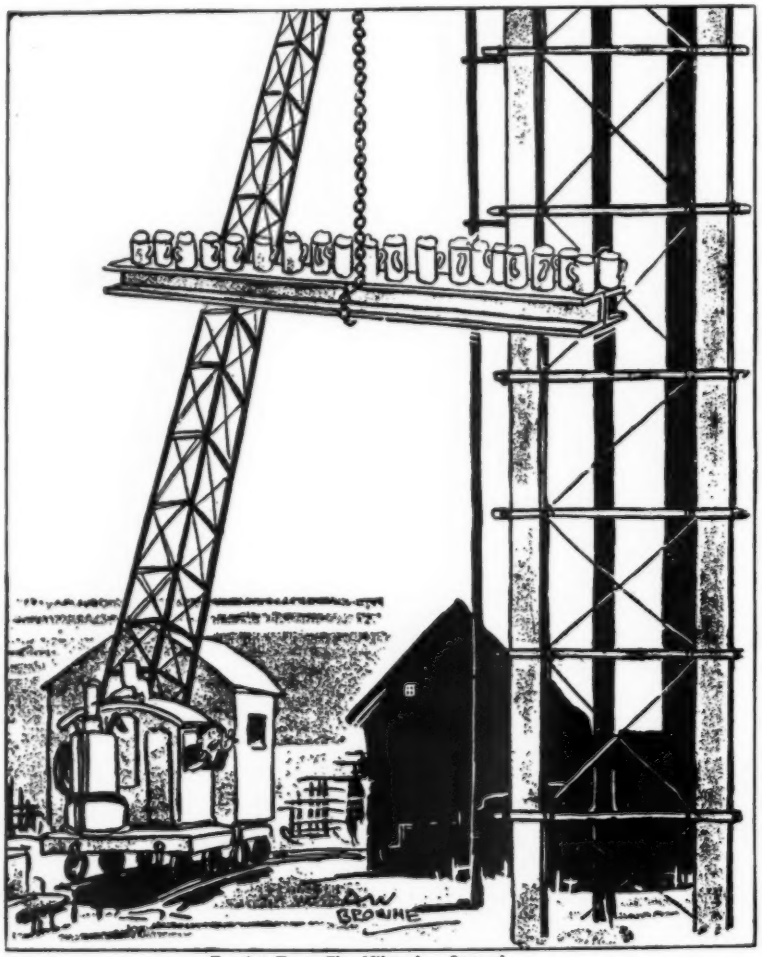
Wit: "We're making nightshirts this week."

Steno: "You had no business to kiss me."

Boss: "It wasn't business, my dear, it was pleasure."

"What shall I do?" wailed the sweet young thing; "I'm engaged to a man who just cannot bear children."

"Well," remarked the kindly old lady, "you mustn't expect too much of a husband!"



Reprint From The Milwaukee Journal

"Hi! Twenty pints coming up!"

"Ten stitches did the doctor have to put in my husband after the fight with your old man last night."

"Ten, was it? Well, when the doctor seen me poor husband carried in, says he: 'Has any wan got a sewing machine?' "

Girls, when they went out to swim
Once dressed like Mother Hubbard:
Now they have a bolder whim,
They dress more like her cupboard.

"Liza, you remind me fo' all de world of brown sugah."

"How come, Sam?"

"You am so sweet and so unrefined."

Shovel Operator:—"You look lovelier to me every minute. Do you know what that is the sign of?"

Girl:—"Sure, you're going to run out of gas any minute."

He: "Do you understand what 'knee-action' is, in a car?"

She: "I do! And don't you try it!"

Timekeeper: "Sir, my wife said I was to ask for a raise."

Contractor: "Good, I'll ask my wife if I may give you one."

Oiler: "What color bathing suit was she wearing?"

Operator: "I couldn't tell. She had her back turned."

He: "Would you endorse our bathsoap for $2,000?"

She: "For $2,000, I'd bathe with it!"

The Scotchman, who was out in the pasture, lost his tam-o-shanter. He had to try on several before he found his own.

Trade Notes

R. G. LeTourneau, Inc., of Stockton, California, announces the opening, April 1, of a factory branch at Peoria, Illinois, to handle the constantly growing demand in the East, South and Middle West for LeTourneau equipment. A full stock of LeTourneau units and parts will be available at the new plant and effective at that time, Peoria F.O.B. list prices will be the same as the Stockton F.O.B. list. A staff of field engineers and service men, specially selected for their knowledge of contractors' problems and the ability of LeTourneau equipment to solve those problems, will work out of the new office.

Book Reviews

Concrete Road Specifications — A charted summary of concrete road specifications used by State highway departments, corrected for 1934, has been prepared by the **Portland Cement Association**, 33 West Grand Ave., Chicago. It gives in condensed form, requirements for grading and quality of the fine and coarse aggregates, proportions and strength requirements for the concrete, methods for finishing and curing and other items of interest. A copy may be had by writing the association.

Contractor Tools — The Independent Pneumatic Tool Company's new No. 40 Catalog on Mining and Contractor's Tools is now ready for distribution. The catalog includes information on paving breakers, stopers, mountings, excavating, tamping and surfacing tools, sump pumps and other tools used in the mining and contracting field. A copy may be had by writing the Independent Pneumatic Tool Co. at 600 W. Jackson Blvd., Chicago, Ill.

Motor Price Wheel—The Louis Allis Company has prepared an unusual motor price wheel. It consists of two fibre discs about eight inches in diameter, printed in attractive colors, which quickly and accurately tell the frame sizes and list prices of 448 popular sizes and types of electric motors. One of these price wheels may be had by writing the Louis Allis Company, Milwaukee, Wisconsin.

Industrial Cable—A new publication of the **General Electric Company**, Schenectady, N. Y., describes and lists all standard types of insulated wire and cable used for transmission, distribution and control, and used on or with electric equipment such as power excavators, mining machinery, locomotives, arc welders, etc. A copy of this 128-page catalog is available upon request to the General Electric Company.

Core Drills—Ingersoll-Rand's recently issued bulletin No. 2096 covers the Calyx Core Drill . . . a drill for boring small or large cores for exploration or other purposes. The Class W Calyx Drill described in the new bulletin will bore a core 2½" diameter, 2,500 feet deep, accurately revealing the exact nature of the rock structure. It will bore larger cores, up to 34½" diameter, 200 feet deep, for ventilation, dewatering, and backfilling of stopes in mines; for water wells and hydraulic elevator shafts in large buildings; for underpinning of existing building columns; for setting tubular steel piles in rock formation etc. The Calyx Drill is also used for exploring oil field structure with fish tail and core bits. A copy of the bulletin may be obtained from Ingersoll-Rand, 11 Broadway, New York, or any branch.

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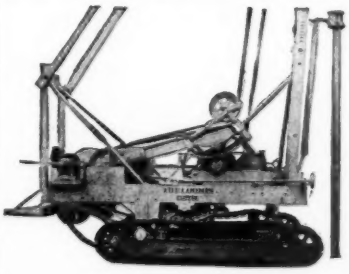

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1 CU. YD. DIPPER—24′ BOOM—18′ DIPPER HANDLE—Slightly used but good conditioned. Suitable for any Bucyrus-Erie GA-2 or GA-3 Machine. SE-25.

1 CU. YD. DIPPER—24′ BOOM—16′ DIPPER HANDLE—Rebuilt and Guaranteed. Suitable for application Bucyrus-Erie GA2 or GA3 Machines. SE-26.

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1¼ CU. YD. DIPPER—25′ BOOM—17′ DIPPER HANDLE—Slightly Used Rope Crowd High Lift Shovel Equipment suitable for Model 37-B. New Machine Guarantee. SE-5

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Dragline Equipment

35′ CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-2.

40′ CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-3.

48′ CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model E-2. Brand New. DL-6.

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40′ CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on 30-B Diesel. Brand New. DL-8.

45′ CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model 30-B Diesel. Brand New. DL-9.

BRAND NEW Ropes included with each of above Dragline Equipments.

All of above equipment is BRAND NEW and of BUCYRUS-ERIE manufacture.

Skimmer Scoop

¾ CU. YD. DIPPER—20′ Boom together with all necessary ropes and material to completely convert Bucyrus-Erie 1020 Shovel, Clamshell or Dragline to Skimmer Scoop Machine. Brand New. Shipment 2 to 3 weeks. SS-1.

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BRAND NEW PAGE, two dippers each ¾ cu. yd., one 38″ wide over cutters, the other 49½″ wide over cutters. 17′1½″ Boom and all necessary auxiliary equipment. Will fit Bucyrus-Erie 1030 or 1035. DS-7.

1-CU. YD. 42½″ WIDE SOLID TYPE DIPPER —24′ Boom and all auxiliary equipment—will dig maximum depth of 22′—For application to GA-2 or GA-3 Clam Shell or Drag Line. Rebuilt —New Machine Guarantee. DS-8.

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P&H MODEL 208—45′ BOOM DRAGLINE—4-cylinder 7¾″x9″ Twin City gasoline engine and 1½ cu. yd. Omaha bucket. SCD-20.

MEAD-MORRISON GASOLINE COMBINATION SHOVEL-CLAMSHELL. ½ cu. yd. Dipper, 17′ Dipper handle—18′ Boom—32′ Clamshell Boom and ½ yard Erie Clamshell Bucket. 5″x6″ 4-cyl. Wisconsin Engine. Good mechanical condition. Bargain Price. SCD-28.

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BYERS "BEARCAT" Gasoline ⅝-yard Shovel. Hercules engine. Overhaul. Good mechanical condition. SCD-25.

THEW-UNIVERSAL MODEL 35 — Gasoline — ½ cubic yard standard shovel equipment—25′ lattice type crane boom and ½ yard Williams bucket with teeth—complete drag shovel attachment and skimmer scoop bucket, including home-made trailer. Excellent condition. SCD-26.

BUCYRUS-ERIE MODEL 30-B DIESEL SHOVEL—25′9″ Boom, 14′ Dipper Handle, 1 yd. Dipper. SCD-9.

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1 CUBIC YARD MANGANESE DIPPER. Will fit Bucyrus-Erie B-2 or GA-2. Good condition. D-40

2 1 CU. YD.—Cast Front Inserted Tooth Dippers. Rebuilt and Guaranteed. Suitable for application GA2 or GA2 Machines. D-34.

1 1¼ CU. YD.—VAN PORT—ROCK TYPE. Will fit E-2, 41-B or 42-B. Slightly Used. D-26.

2 1¼ CU. YD.—VAN PORT—ROCK TYPE. Will fit E-2. Brand New. D-27

1 1¼ CU. YD. CAST FRONT INSERTED TOOTH DIPPER. Will fit 37-B. Slightly used. D-38.

1 1½ CU. YD.—PLATE. Will fit E-2. Brand New. D-28.

1 1½ CU. YD. CAST FRONT INSERTED TOOTH DIPPER. Will fit 43-B. Slightly used. D-39.

2 1½ CU. YD.—Manganese Front Inserted Tooth. Will fit E-2, 41-B or 42-B. Slightly used. D-29.

1 1½ CU. YD.—Vanderhoef type with Vanderhoef teeth. Will fit E-2 or 42-B. Slightly Used. D-30.

Large Machines

1 2½ CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on 68-C and 70-C machines. Brand New. D-1.

2 3 CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on Model 100-B, 68-C, 70-C Machines. Brand New. D-2.

1 3½ CU. YD.—Front 2¾" Nickel Chrome Steel, two part Van Port Reversible Teeth. Can be used on Model 88-C, 95-C, Class 180. Brand New. D-3.

1 4 CU. YD.—Front 2¾" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Has seen some service but in good condition. Can be used on Model 100-C, 120-B. D-4.

1 4½ CU. YD.—Lip 2¼" Manganese Steel, two part Reversible Manganese Teeth. Can be used on Model 88-C, 110-C. Brand New. D-5.

3 6 CU. YD. Molybdenum Steel Front. Annealed Cast Steel Back, two part Reversible Van Port Teeth. Can be used on 225-B and 320-B. Brand New. D-11.

1 8 CU. YD.—Front Molybdenum Steel, two part Van Port Reversible Teeth. Can be used on Model 320-B. Slightly Used but excellent condition. D-6.

DRAGLINE BUCKETS

BRAND NEW

1 ¾ CU. YD. PAGE CLASS "C". Approximate weight each 2425 lbs. DB-1

1 1½ CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 2900 pounds. DB-15

3 2 CU. YD. PAGE CLASS "C." Approximate weight each 5630 lbs. DB-4.

3 2¼ CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 3850 lbs. DB-13.

4 2½ CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 4600 lbs. DB-14.

1—5 CUBIC YARD HEAVY DUTY—approximate weight 12000 pounds. Item DB-16

1—6 CUBIC YARD TYPE W MONIGHAN BUCKET—approximate weight 12500 pounds. Item DB-17

1—7 CUBIC YARD TYPE W MONIGHAN BUCKET—approximate weight 13700 pounds. Item DB-18

REBUILT

1 2 CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 3200 lbs. DB-12.

1 2½ CU. YD. BUCYRUS-ERIE INSERTED TOOTH. Approximate weight 6500 lbs. DB-9.

1 2½ CU. YD. OMAHA STANDARD. Approximate weight 5400 lbs. DB-10.

USED

1 1 CU. YD. PAGE BUCKET. DB-20.

1—6 CUBIC YARD TYPE W MONIGHAN—approximate weight 12500 pounds. Item DB-19

BOILERS

BRAND NEW

Will Make That Old Shovel Work Like New.

Can also be used for Miscellaneous Service

Vertical Type

3 46½"x110"—40 H.P.—155 lb. Working Pressure. Special Wood Burning Fire Box. ASME Std. Will fit any B-2 or B-3. B-9.

1 54"x100"—41 H.P.—125 lb. Working Pressure. ASME Std. Will fit B-2 or B-3. B-11.

Locomotive Type

3 44"x17'—75 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 68-C. B-13.

1 44"x18'—88 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 70-C. B-14.

2 54"x11'3"—92 H.P.—125 lb. Working Pressure. ASME and Mass. Std. Will fit Model 50-B Machine. B-16.

ELECTRICAL EQUIPMENT

MOTOR—GENERAL ELECTRIC—3 phase, 25 cycle, 550 volt, 1500 RPM., 90 HP., BRAND NEW. EE-1.

50 KW MOTOR GENERATOR SET—GENERAL ELECTRIC—consisting of 3 phase, 60 cycle, 440 volt, 1170 RPM., 75 HP., Induction Motor connected to 50 KW, 250 volt, 1200 RPM., Generator, including suitable rheostat and compensator. BRAND NEW. EE-2.

COMPENSATOR — GENERAL ELECTRIC—75 H.P., 2220 volt, 3 phase, 25 cycle, manual type. BRAND NEW. EE-3.

TRANSFORMER—GENERAL ELECTRIC—5-KVA, 2200-3810 volt primary, 440-220 volt secondary—3 phase, 60 cycle, with cast iron tank and cover, including specially fastened bushings to prevent oil leakage. BRAND NEW. EE-4.

GENERATOR — WESTINGHOUSE — 125 KW, 250 volts, 500 amperes. Direct Current. 440 RPM. Includes two outboard bearings. BRAND NEW. EE-5.

MOTORS (2) — GENERAL ELECTRIC — 21.5 H.P. 3 phase, 60 cycles, 440 volt, 900 RPM. Totally enclosed—ball bearing. BRAND NEW. EE-6.

AIR COMPRESSORS

1 BRAND NEW WORTHINGTON—METAL-WELD—2-cylinder 7"x6" Vertical 162 cu. ft. piston displacement, Air Compressor. Fitted with Laidlaw feather valves—Lugs on side for mounting on skids or channels—Shaft extended and equipped with semi-flexible coupling to take 2⅝" drive shaft—Force feed lubrication. Automatic control. Includes 1" High capacity centrifugal circulating pump—"V" belt driven—18"x41" Air Receiver, 100 pounds working pressure. A.S.M.E. Standard. Electric or gasoline power required approximately 30 H.P., approximately 1000 R.P.M.—Compressor Speed approximately 550 R.P.M. — Overall dimensions:—Height 45"—Length 37½"—with 28". AC-3.

2 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. Brand New. AC-1.

1 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. Used. Make offer. AC-2.

ROAD ROLLERS

1 10-TON BUFFALO SPRINGFIELD GASOLINE ROLLER with scarifier. About three years old. Splendid condition. Very favorable price. RR-1.

ENGINES

Designed especially for application to Excavating or similar Equipment. Can be used for stationary or semi-stationary service.

Diesel

2 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—5-cylinder, 9" bore x 10½" stroke, 150 H.P. at 450 R.P.M., 4 cycle, Vertical—valve in head type. Dust proof, Oil tight crank case and forced lubricating system. Also auxiliary air starting equipment. DE-2.

1 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINE—4-cylinder, 6" bore x 8" stroke, 45 H.P. at 650 R.P.M., 4-cycle, Vertical—valve-in-head type. DE-5.

Gasoline

1 MODEL HH-U NOVO—16 H.P. ENGINE—4-cylinder, 3¾" x 4"—1200 R.P.M.—Radiator cooled—complete power plant—mounted on channels—sheet metal housing—extended crank shaft 1⅞" diameter, including outboard bearing with Fafner ball bearing. GE-1.

Steam

1 12½"x16" link reversing type for Railroad Shovel. ME-1.

2 4½"x5" reversible—20.8 H.P. at 400 R.P.M. 100 lb. Pressure. ME-2.

1 4¾"x5" reversible—23.2 H.P. at 400 R.P.M. 100 lb. Pressure. ME-3.

2 5"x5" reversible—25.6 H.P. at 400 R.P.M. 100 lb. Pressure. ME-4.

LOCOMOTIVES

3 24-INCH GAUGE 3-TON BALDWIN GASOLINE LOCOMOTIVES, Model AL, Type 2. Price very favorable. L-1.

TRAILERS

1-14 TON WILLIAMS "ECONOMY" TRAILER. Arch Girder Construction—Safety Chains—Rear Loading ramp. Solid Rubber tired wheels 28"x10" front 28"x16" rear. Deck dimensions 12'x7'9"x31½" high. Brand new. T-1.

PUMPS

1 NB—3 STAGE CENTRIFUGAL PUMP—2" suction and discharge — bronze impeller and shaft—capacity 100 gallons per minute at 240' head operating at 1720 RPM or 270' head at 1780 RPM. Now equipped for belt drive but can be operated by 15 HP Electric Motor. ME-6.

Largest St. Louis Basement Presents Unusual Digging Problems

(Continued from Page 172)

clean probably could have produced fifty-percent again as much water in a day. However, it is located where it will not interfere with the building of the retaining wall, so capping will take care of it satisfactorily.

In another tunnel only a short distance from the water supply, "samplers" evidently held forth. The walls are said to have been decorated with appropriate pictures which one would expect to find on the wall of a respectable middle-nineteenth century beer garden. Faint traces of inscriptions, too, were discernible to the eye.

How many, or how extensive these old tunnels are, no one seems to know with any degree of accuracy. They are said to run through to Cherry Street, which is two blocks north of Market, and three from Walnut where the well and beer garden were found.

Building Rests on Caissons

When the new site was first drilled, the original borings made on the south half indicated the presence of solid rock at such a depth as to make it uneconomical to sink caissons to reach it. Consequently the original plans called for the driving of approximately 35,000 lineal feet of concrete piling to an average depth of 30 feet in this area. However during the progress of excavation in this part of the site, it developed that solid rock was much closer to the surface than was expected and consequently caissons were used instead of the piling. As a result the entire building will rest on caissons. This will require 148 caissons which will vary in depth from 10 to 90 feet from the finished subgrade of the basement. Six of these are rectangular, six feet by four feet, while the remainder are cylinderical and vary from four to eight feet in diameter.

● *Six jack hammers break up the rock and masonry arches in the north end of the job.*

The hard limestone on which the caissons are to rest is covered with from three to twenty-five feet of stratified or seamed limestone which is to be removed. The holes for the caissons are being excavated on a sub-contract by the Gow Company of Boston, a subsidiary of the Raymond Concrete Pile Company of New York. They use a Marion gas-electric boring machine which excavates the earth down to the rock. After rock is reached the hole is continued by hand until test holes show eight feet of unseamed stone.

Excavation Handled with Six Steamers

All six of the Fruin-Colnon Type B Bucyrus-Erie steamers were used as shovels at the start of the digging and when the work required the use of clamshells they were changed over. By the middle of December, four of these machines were working with a crane boom as clamshells or pile drivers, and two of the machines continued to work as shovels. Night shovel work up to December 15 was carried on with the aid of large General Electric flood lights which were focussed on the trucks. Auxiliary portable carbide lights were used to guide the drivers up and down the ramps.

Profit by comfort

TO increase your output, especially during the late hours of each shift, modernize your machines with Beco Seats. By providing lasting comfort for your operator, by insulating him from vibration, and because they are adjustable to the individual, these new seats enable your operator to handle levers rapidly, throughout the entire day, with a minimum of strain and fatigue.

Over even short periods, the comfort and proper support of a Beco Seat will pay big extra-output dividends on its small original cost. 1030

BUCYRUS-ERIE

Excavating, Drilling & Material-Handling Equipment «» South Milwaukee, Wis.

For your convenience in writing to Bucyrus-Erie, you will find a card bound in this issue.

Six air hammers were used at the north end of the excavation in taking off the last three feet of stone and debris to get down to Elevation 49.17 and to break up the stratified limestone to get solid footing for the caissons. Air was supplied by three Sullivan and one Ingersoll-Rand 220-foot air compressors operated in a central compressor house located on the north edge of the cut.

Subcontractor Does Trucking

The trucks used to take the dirt away from the shovels and clamshells were owned by Arthur Morgan, prominent St. Louis contractor. Most of the trucks were furnished on contract with a few being placed on an hourly basis. Twenty-two trucks in all were used, most of them Macks with several new Internationals. The dirt was spoiled in Eierman's Quarry located at Grand Avenue and Hickory Street—some ten blocks south and sixteen blocks west of the digging. This old quarry is said to be 180 feet deep in places. To speed up the dumping at the quarry, a half-dozen shovels full of cinders were thrown into each empty truck before taking on a new load. This enabled the mixture of wet clay and earth to slide out of the trucks with no delay.

● *A close-up of the tunnels shows them to be of extremely sturdy construction.*

Concrete is furnished by General Materials Corporation of St. Louis who have set up a plant adjacent to the job on Clark Street. The plant is equipped with Fruin-Colnon machinery and it is expected that fully 8,000 cubic yards of concrete will be turned out at this plant.

At the extreme south end of the site about 6,000 cubic yards of earth will be stored to be used later for back filling along the east wall.

Job Well Manned

The architects of the new St. Louis postoffice are Klipstein and Rathmann of St. Louis. Jesse I. Marshall is the construction engineer. W. J. Knight and Company are the structural engineers.

This Fruin-Colnon Contracting Company job is being handled under the direct supervision of Joseph E. Vollmar, Vice-President, with Geo. Newell as Super-

POSITIONS WANTED

Positions wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00. Advertisements for help wanted free of charge.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

OPERATOR

Thirty years experience on coal stripping, railroad and highway construction. Prefer coal stripping anywhere. Can do own repair work and furnish best of references. Married. Present location. Pennsylvania. Box 6501.

SHOVEL OPERATOR

Five years' experience on Bucyrus-Erie Gas+Air on basement excavation, highway and street grading. Also eight years experience on Erie, Marion, Bucyrus steam shovels. Will go anywhere. Can do own repairing. A-1 reference. Sober and reliable. Present location Minnesota. Box 7201

EXPERT DRAGLINE AND SHOVEL OPERATOR

16 years' experience as shovel operator. Married, 36 years of age. Have operated practically all makes of machines, and have 10 years' experience as dragline operator. Can handle steam, Diesel, electric or gasoline machine. Have worked on highway and railroad grading, rock excavation in quarry, drainage and irrigation and dredging and also gold dredging. Prefer position on Bucyrus-Erie E-2, D-2, or 50-B or other Bucyrus-Erie machines. Have also operated Class 220 and 225 electric and Diesel electric machines. Capable of taking charge of repairing and erecting and can handle crews. Best of references and can do own repairing. At present located in California, but will go anywhere. Box 5507.

OPERATOR—PIT FOREMAN—DRILL FOREMAN

14 years' experience as shovel operator and pit foreman on coal stripping, railroad grading, highway grading, quarry and gravel pit work. Drill foreman on blast hole, tripper rod and air drills. Can operate oxy-acetylene cutting and welding torch. Can do own repair work. Age 41. Can furnish good references. Willing to go anywhere in U. S. A. Now located in Tennessee. Box 7101.

EXPERIENCED DRAGLINE OPERATOR

Fifteen years' experience on Bucyrus-Monighan, P&H, Northwest and other makes of Steam, Diesel, gas and electric draglines on levee work and phosphate mines. Hold three sets civil service papers with ratings of 70%, 85%, and 100%. Married but can go anywhere. Furnish excellent references. Present location, Louisiana. Box 5903.

OPERATOR

15 years experience on Erie, Keystone and Osgood gas machines. Can do own repair work. Willing to go anywhere in U. S. A. Box 7200

OPERATOR

15 years experience on gasoline, steam and electric machines. Bucyrus-Erie, Thew and Northwest machines. Prefer operating Bucyrus-Erie. Have worked on highway and railroad grading, quarry, excavation. Willing to go anywhere in U. S. A. Can do all repairing and furnish excellent references. Box 7001.

STEAM SHOVEL OPERATOR

14 years experience on Steam shovels and draglines, on highway construction, rock, quarry, gravel pit, also five years as shovel foreman in coal stripping. Can do own repair work on any type steam machine and willing to go anywhere in U.S.A. Present location, Tennessee. Box 7000.

GAS OR STEAM SHOVEL OPERATOR

7 years' experience on cutting slopes, gradings and highway construction, not afraid of work. Would like a position on any type of small machine anywhere in the U.S.A. Can do his own repair work and furnish good references. Box 6500.

STEAM SHOVEL OPERATOR

14 years' experience with steam machines only on Railroad and Highway grading, coal stripping, Rock Quarry and Gravel Pits. Can do own repair work, furnish references and willing to go anywhere. Present location, Tennessee. Box 6700.

● *The size of the old arches is graphically shown here with Pitman Pfefferkorn standing beside one of them.*

intendent and Dan Mackin, Assistant Superintendent. Officers of the Fruin-Colnon Contracting Company in addition to Mr. Vollmar are: A. P. Greensfelder, President; S. W. Bowen, Second Vice-President; E. Dickey, Secretary; and A. Randall, Treasurer. R. W. George is office engineer. The shovel and crane operators employed on the job to hustle the Bucyrus-Erie steamers along include: Frank Gorman, J. S. Morgan, Norm Prime, H. C. Pope, R. W. Allen, Lloyd Robinson, Luther Fritz, Frank Farmer, and Van Fritsch. The steam hustlers include: T. J. O'Connell, H. Welsher, Wm. Kalin, Frank Hollenbeck, Buck Eirten, George Luick and Lloyd Welsher. The pile driving was in charge of Foreman H. E. Flora and F. Gerard kept the battery of air compressors going.

Fruin-Colnon Contracting Company, whose main office is in the Merchants Laclede Building, maintain a warehouse at 2101 Clifton Avenue where they put into practice their policy of keeping their equipment in tip top shape. Their 150-day contract for this big basement job was well ahead of schedule during the entire progress of the work.

FOR SALE

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Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards

THEW-LORAIN 75-B 1¼ CU. YD. gasoline shovel. AA-1 condition. Located Texas. Box No. 565-SS.

BUCYRUS ERIE GA-2 Gas-Air High Lift Shovel—24′ Boom, 16′ Dipper Handle, 1¼ cu. yd. Dipper, Single Shaft Cat, Electric Starter. Waukesha 4-cylinder 6¼″x8″ Gasoline Engine. Reported excellent condition. Located West Virginia. 593-SS.

Drag Shovel

Thew—Universal—Model 35—½-cu. yd. drag shovel complete. Center drive cat. Electric starter. 4 cylinder Waukesha 4½″ x 6¼″ gasoline engine. Also complete ½-yd. shovel equipment and 25′ boom clamshell—crane equipment and bucket together with home-made trailer. Box 468-SS.

THEW-LORAIN 75-A combination 1¼ yard Shovel and 50′ Boom Dragline including one yard Drag Bucket. Good condition. Located eastern Pennsylvania. Box 610-SS.

BUCYRUS-ERIE 1030 GAS, ROPE CROWD SHOVEL. Good operating condition. Located eastern Minnesota. Available for demonstration. Price right for quick sale. Box No. 490-SS.

BUCYRUS-ERIE 35-B ELECTRIC 24′ BOOM, 16′ Dipper Handle, ½ cu. yd. Dipper, 3 phase, 25 cycle, 440 volt, Cat mounted. Box 544-SS.

BYERS MODEL 40—⅜ cu. yd. Cable Crowd Shovel, Outside Dipper Handle, Plate Dipper. ¾ swing. Including Back Hoe Attachment. Hercules 4-cylinder Gasoline Engine. Cat mounted—12″ treads. Located eastern Pennsylvania. Box 554-SS.

REBUILT GA-2 SHOVEL NO. 10817, single shaft cat mtd., 24′ boom, 16′ dipper handle, 1¼ cubic-yard cast front inserted tooth dipper, electric starter, Waukesha 4 cylinder 6¼″x8″ Gasoline Engine, steel cab. New machine guarantee. Box 567-SS.

GA-2 SHOVEL, BUCYRUS-ERIE NO. 9918, 22′ Boom, 16′ Dipper handle, 1 cu. yd. manganese steel front inserted tooth dipper, 20-10 Gas Air single shaft drive, caterpillar mounted, 6¼x8″, 4 cyl. Waukesha Motor. Weight 71,900 lbs. Reconditioned. Located Greensboro, N. C. Price $5000.00. Box 595-SS.

NORTHWEST MODEL 105 SHOVEL. Bargain Price. Located Texas. Box No. 566-SS.

If You Do Not Find What You Want Listed—Write Us

The Excavating Engineer
South Milwaukee, Wis.

BUCYRUS-ERIE—42-B Steam Shovel. Caterpillar Mounted, 21′ Boom, 15′ Dipper Handle, 1½ Cubic Yard Dipper, Power Boom Hoist. This machine excellent mechanical condition. Located Birmingham, Alabama. Can be demonstrated. Box 531-SS.

2 BUCYRUS-ERIE—GA-2—Combination—45′ Boom Clamshell—Crane machine and Extra High Lift Shovel equipment. Cat mounted—Self starter—All field rebuilt last year—Excellent condition—Located Eastern Pa. Box 485-SS.

BUCYRUS-ERIE GAS-AIR TYPE GA-2 HIGH LIFT SHOVEL—22′6″ boom—16′ dipper handle—1¼ yard cast front inserted tooth dipper—single shaft caterpillar mounting—electric starter. Excellent condition. Field reconditioned. Waukesha 4-cylinder 6¼″x8″ engine—New cylinder blocks and piston rings. Located near Scranton, Pennsylvania. Will demonstrate. Box 508-SS.

Marion Type 32 Steam Shovel, Shop No. 5676, 18′ boom, 15′ dipper handle, 1¼-cu. yd. dipper shipped May, 1926, good operating condition. Box 451-SS.

BUCYRUS-ERIE 43-B GASOLINE CHAIN CROWD SHOVEL — 23′ boom — 17′ dipper handle—1½ cubic yard Vanderhoef dipper and teeth—electric starter—standard single shaft cat. Operated less than six months. Excellent appearance and condition. Will be demonstrated by owner. Located vicinty New York. No. 512-SS.

LIMA MODEL 101—Combination 1¼ yard shovel and 40′ plus 10′ extension Dragline—powered with gasoline engine Model JK 6½″ x7″—4 cylinder. Shovel equipment practically new. Located Colorado on C.R.I.&P. Box 599-SS.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

NORTHWEST NO. 4—24′ Boom, 16′ Dipper Handle, 1 yard Dipper—Gasoline—Located eastern New York. Good condition. Box 600-SS.

BUCYRUS-ERIE GA-2—Gas-Air Combination High Lift Shovel and 50′ Boom Dragline Equipment, mounted on Single Shaft Cat. Good operating condition. Located near Ponca City, Okla. 537-SS.

BUCYRUS-ERIE B-2—Late Model High Lift, Single Shaft Cat Mounted, Steam Shovel. Excellent condition. Located vicinity Boston. To be demonstrated. 538-SS.

BUCYRUS-ERIE GAS+AIR—22′ Boom, 16′ Dipper Handle, 1¼ cubic yard Dipper, Waukesha 6¼″x8″ four cylinder gasoline engine. Single Shaft Cat mounted. First class condition. Located eastern New York. Box 601-SS.

P&H MODEL 207—40′ Boom Dragline—Buda Gas Engine. Field reconditioned. Box 453-SS.

Type "B" Caterpillar mounted, equipped with 19′6″ boom, 16′ dipper stick and ¾ yard dipper, in good working order. Located near Hudson, Pennsylvania. Price $1750.00. Box 493-SS.

BUCYRUS-ERIE D-2—1 cubic yard Caterpillar mounted—Atlas Diesel Engine. Located western Pennsylvania. Box 596-SS.

ONE 18-B BUCYRUS-ERIE, ⅞-yard dipper on full revolving caterpillars. Box 182-SS.

THEW-LORAIN 75-A. 1¼ CU. YD. GASOLINE SHOVEL. Fair condition. Very favorable price. Located North Carolina. Box 553-SS.

BYERS BEAR CAT—⅝ yd. Gasoline Shovel—Recently overhauled — Located Birmingham, Alabama. Box 480-SS.

P & H MODEL 600—1 yd. Gasoline Shovel—including 40′ boom dragline equipment without bucket. Waukesha Engine. Recently overhauled. Located in Alabama. Box 483-SS.

If You Do Not Find What You Want Listed—Write Us

The Excavating Engineer

South Milwaukee, Wis.

NORTHWEST MODEL 6—1½ CU. YD. SHOVEL—22′ Boom, 19′ Dipper Handle, Caterpillar Diesel Model D-11000 6-cyl. Engine. Rebuilt early this year. Excellent condition. Located eastern Pennsylvania. Box 547-SS.

BUCYRUS-ERIE 41-B STEAM SHOVEL—21′ Boom, 15′ Dipper Handle, 1¼ cu. yd. Dipper, Power Boom Hoist, Cat mounted. Located New York City. Box 545-SS.

KOEHRING MODEL 502 SHOVEL—24′ Boom, 16′ Dipper Handle, 1½ cu. yd. Dipper, Cable Crowd. 4-cyl. Wisconsin Gasoline Engine. Electric Starter. Automatic Trip. Chain Drive Cat. Excellent condition. Located near New York City. Box 552-SS.

TWO (2) MODEL 301 STANDARD KOEHRING MACHINES, good operating condition. Now operating and can be inspected in southwestern Ohio. Price, $3,000.00 each. Box 540-SS.

LIMA MODEL 101—1¼ yard Shovel, Waukesha type WL Gasoline Engine. Very favorable price. Located Kansas City, Missouri. Box 598-SS.

BUCYRUS-ERIE 41-B STEAM SHOVEL—21′ boom, 15′ dipper handle, 1¼ cubic yard Vanderhoef front quarry dipper, power boom hoist. Cat mounted. Good condition. Located near Boston. Price very reasonable. Box 604-SS.

BUCYRUS-ERIE GA-2 Gas-Air—Extra high lift 24′ boom—18′ 4″ dipper handle, 1 cu. yd. dipper. Single shaft cat mounting—air starter. Good condition. Located near Hartford, Conn. Box 523-SS.

1 BUCYRUS-ERIE B-2 Steam ⅞ yard High Lift Shovel—Cat Mounted. Good operating condition. Located near Boston. Make offer. Box 521-SS.

FOR SALE CHEAP

Marion Model 440 Gas Shovel and Dragline, 1 cubic yard capacity. For sale cheap. Located Missouri. Box 634-SS

BRAND NEW PAGE DRAG SHOVEL EQUIPMENT suitable for application to Bucyrus-Erie 1030, 1035, or 32-B machines now in the field, consisting of 17-foot 1½-inch boom, 11-foot dipper handle, and two ¾ cubic-yard dippers; one 38-inches wide over cutters—the other 49½-inches wide over cutters, together with auxiliary A frame and ropes. Priced below cost. Box 381-SS.

BUCYRUS-ERIE MODEL 1025 GASOLINE COMBINATION ⅝-YARD SHOVEL — 35′ Clamshell, including ¾-yard Williams Clamshell Bucket. Located near Oshkosh, Wisconsin. Good condition. Box No.504-SS.

Make an Offer

MARION SHOVELS

—Model 450 Electric Shovel, 1¼ cubic yard dipper and 2 yard plate-dipper.

—Model 450 Electric Combination Shovel and Dragline. ¾ yard dipper, 1 yard dipper, and 1¼ yard dipper, also 2 cubic yard light, plate-front dipper. Boom adjustable 40′, 45′ and 50′.

—No. 7 Gas-Electric, Combination Shovel and Crane. ¾ yard shovel dipper, 45′ crane boom.

—No. 7 Gas-Electric, Standard ⅞ cubic yard shovel. Good condition.

—Model 480 Electric, Combination shovel and dragline. 70′ boom and Type X Bucket,—2 cubic yard capacity. Shovel dipper 2 cubic yard. Good condition.

—Model 480 Electric Dragline. 70′ boom, 2 yard X Bucket. Good condition.

—Model 490 Electric Shovel. 2¼ cubic yard dipper. Good condition.

Box 633-SS

BUCYRUS-ERIE LATE MODEL B-2 STEAM HIGH LIFT SHOVEL. 1 yard dipper—single shaft cat mounting. Good condition. Located near St. Louis. Box 518-SS.

BUCYRUS-ERIE 41-B STEAM SHOVEL: 21′ boom, 15′ dipper handle, boom hoist, dipper trip, 1¼ cu. yd. Vanderhoef dipper, cat mounting, now located and can be demonstrated at Colchester, Conn. Very favorable price. Box No. 532-SS.

BUCYRUS-ERIE 42-B STEAM SHOVEL—late model, 21′ boom, 15′ dipper handle, 1½ cu. yd. Vanderhoef dipper, boom hoist, dipper trip. Massachusetts standard boiler, cat mounting. Good operating condition. Now located and can be demonstrated at Colchester, Conn. Box No. 533-SS.

MARION MODEL 450—1¼ Cu. Yd. Steam Shovel, Cat Mounted. New Gears on Caterpillar recently installed. Price favorable. 536-SS.

BUCYRUS-ERIE MODEL 1035—Gasoline, Chain Crowd Shovel, Single Shaft Cat, 26″ Treads, Electric Starter, ⅞ Cu. Yd. Dipper. Now operating. Can be demonstrated. Located Massachusetts. 535-SS.

BUCYRUS-ERIE TYPE B STEAM COMBINATION SHOVEL-CLAMSHELL AND STEAM HOE. Machine completely rebuilt 1929. Good operating condition. Located near Boston. Box 517-SS.

GENERAL ½ cubic yard Gasoline Shovel—including 30′ Boom Clamshell and Dragline Equipment—New 1931—powered with Buda DW6 High Altitude Gasoline Engine. Excellent condition. Located near Denver. Box 588-SS.

BYERS MASTER SHOVEL — 26′ Boom, 17′ Dipper Handle, 1¼ cu. yd. Dipper, New January 1931. Good working condition. Located Melvern, Kansas—Highway 75 south of Topeka. Price very favorable. 591-SS.

BUCYRUS-ERIE GA-2 Gas-Air Extra High Lift Shovel—24′ Boom, 18′4″ Dipper Handle, 1¼ cu. yd. Dipper, Single Shaft Cat. Electric Starter. Excellent condition. Located eastern Pennsylvania. 592-SS.

LIMA 101 GASOLINE 1¼ YARD SHOVEL. Located eastern Pennsylvania. Good operating condition. Price reasonable. Box 576-SS.

MARION MODEL 450—1¼ **YARD SHOVEL.** AC-DC power. For 60 cycle, 3 phase, 440 volt current. Located eastern Pennsylvania. Price reasonable. Box 577-SS.

GENERAL COMBINATION SHOVEL-CRANE. Shovel Boom and Handle rebuilt. A-1 shape. ⅝ yard Dipper. 35′ Crane Boom. 12 New Cat Tread Links. Cat mounting and general condition machine—good. Located Georgia. Price very reasonable. Box 578-SS.

NORTHWEST MODEL 105—1 **YARD GASOLINE SHOVEL.** Fair running order. Located Georgia. Bargain price. Box 579-SS.

1—Type B Bucyrus-Erie Combination High Lift Shovel and 40′ Clamshell Machine.
1—Type B Bucyrus-Erie High Lift Shovel.
2—Type B-2 Bucyrus-Erie High Lift Shovels.
All located western Connecticut. Operating condition. Entire lot very low price. Box 573-SS.

2 INSLEY ⅝ YARD GASOLINE SHOVELS. Located eastern New York State. Bargain prices. Box 574-SS.

OSGOOD MODEL 18 Steam—¾ **yard shovel**—Cat mounted. Just completely overhauled. Excellent condition. Located near Indianapolis, Ind. Box 522-SS.

MARION 1 YARD STEAM SHOVEL Box 575-SS.

THEW ¾ YD. GASOLINE CRAWLER SHOVEL, 20′ Boom, 17′ Dipper Stick, Full Revolving. Location Georgia. Box 614-SS

TWO 1030 single motor ELECTRIC SHOVELS. 12′10″ boom, 10′6″ dipper handle, 1 yard rock dipper: also 40′ boom crane equipment, 7′6″ rear end clearance. Electric power supply 3 phase, 60 cycle, 440 volt. Located Philadelphia. Very good condition. Box 626-SS

42-B STEAM SHOVEL—cat mounted. 21′ boom, 15′ dipper handle, two dippers—one 1½ cubic yard Vanderhoef dipper. Power boom hoist. Good condition. Located Rhode Island. Box 627-SS

⅜ YARD SHOVEL

Universal ⅜ yard gasoline shovel—¾ swing. Good operating condition. Located Northern Michigan. Box 636-SS

TYPE "AA" AIR TUNNEL SHOVEL equipped with 9′3″ Caterpillar, 9′6″ boom, 8′ dipper handle and ⅝ cubic yard plate dipper with Panama teeth. Located, New York. Box 620-SS

B-2 STEAM SHOVEL, CAT MOUNTED. 19′9″ boom, 16′ dipper handle, 1 cubic yard dipper. Good running condition. Located, Minnesota. boom, 14′ dipper handle, ¾ cubic yard dip- Box 621-SS

BUCYRUS ERIE — **So. Milwaukee, Wis.**

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FACTORY REBUILT and USED SHOVELS--CRANES--DRAGLINES

Please send me full details on:

☐ Monighan Dragline 60-foot boom. Priced right.

☐ P&H Model 207—40′ Boom Dragline. Reconditioned.

☐ Thew Model 35, ½ yd. Sh. Crane, S. Scoop & Trench Digger.

☐ Bucyrus-Erie GA-2 Shovel. Rebuilt. New Machine Guarantee.

☐ Northwest 45′ Boom Clamshell — 1 yd. capacity.

Name.....

Address.....

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards
Continued

TYPE B STEAM SHOVEL, Cat mounted, 19'6" boom, 14' dipper handle, ¾ cubic yard dipper, also 36' clamshell boom and front drum and gearing. Located Kansas City, Missouri. Box 622-SS

GA-2 HIGH LIFT SHOVEL—24' boom, 16' dipper handle, 1¼ cubic yard dipper, on single shaft cat. Electric starter, Waukesha 4-cylinder 6¼"x8" gasoline engine. Reported excellent condition. Located Virginia. Box 623-SS

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E-2 DIESEL SHOVEL—26' boom, 15' dipper handles, 1½-yard dipper. Atlas Diesel Engine. Located Massachusetts. Box 615-SS

TWO THEW-LORAIN 75-A REBUILT Combination Shovel—23' boom, 1¼ yard dipper, dragline, 50' boom—1½ yard bucket. Good condition. Location, Eastern Pennsylvania. Box 616-SS

43-B GAS SHOVEL—22' boom, 16' dipper handle, 1⅝ yard inserted-tooth dipper. Electric starter. Wisconsin 6 cylinder 6x7" engine. Reconditioned—first class condition. Located, New York. Box 617-SS

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Two Northwest Model 3 Combination Shovel—Dragline and Clamshells, without buckets. Shovel equipment 22'6" boom, 15'4" dipper handle, ¾ cubic yard dipper. Equipped with Wisconsin B-2 4-cylinder 5¼"x6½" gasoline engine. Completely overhauled July, 1934. Excellent condition. Box 635-SS

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TWO KOEHRING MODEL 502 COMBINATION SHOVELS AND CRANES. Each equipped 21' boom, 16' dipper handle, 1¼ cubic yard dipper, 50' crane boom with 10' removable insert. Kohler light plant driven by 4-cylinder gasoline engine. Excellent condition. Only handled one job. Shovel equipment has seen very little service. Located Philadelphia. Box 632-SS

Small Draglines
Under 2 Yards

NORTHWEST MODEL NO. 7—40' boom dragline and 1¾ cu. yd. Omaha drag bucket. Powered with Twin City 4-cylinder 7¾"x9" gasoline engine. Caterpillars 24" treads x 14' long. Located in Louisiana. Box No. 560-SD.

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NORTHWEST—MODEL No. 4—50' boom dragline including drop ball for rock breaking. Cat mounted. 4 cylinder 6 x 7 Wisconsin gasoline engine. Excellent operating condition. Located vicinity New York. Box 470-SD.

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MONIGHAN BRAND NEW—40' Boom Dragline. Cat mounted, Waukesha four-cylinder 6½"x7" Gasoline Engine, 900 R.P.M., 93 H.P. Electric Starter, Steel Cab. Exceptional Value. Box 453-SD.

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THEW-LORAIN 75-A combination 1¼ yard Shovel and 50' Boom Dragline including one yard Drag Bucket. Good condition. Located eastern Pennsylvania. Box 610-SD.

TWO P&H 700 DRAGLINES. 1½ cu. yd. buckets on 50' booms. Gas and Diesel. Located Lower Rio Grande Valley, Texas. Box 618-SD

Small Clamshells and Cranes
Under 2 Yards

NORTHWEST — MODEL 105 — 45' BOOM CRANE. Cat mounted, 1 yd. capacity. 6¼x8 Twin City gasoline engine. Good operating condition. Located vicinity New York. Box 469-SCC.

BUCYRUS-ERIE 1030 GASOLINE 40' BOOM CLAMSHELL MACHINE. Cat mounted. No Bucket. Recently overhauled. Guaranteed. Located Kansas City. Box 543-SCC.

NORTHWEST MODEL 105 Gasoline—40' boom clamshell. Good operating condition. Located Iowa. Box 516-SCC.

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THEW-UNIVERSAL 35 CRANE on center drive cats, 36' Boom, fairleads, ½ yd. dragline bucket, 3000 lb. hammer, leads and cap. Excellent condition, sale or rent. Located Western Ohio. Box 457-SCC.

BYERS BEARCAT 25' BOOM CLAMSHELL (¾ swing) and ½ cu. yd. Clamshell Bucket, including Trench digging attachment carrying ½ cu. yd. dipper. 24" wide over cutters—will dig maximum 15'. Good operating condition. Very attractively priced. Located vicinity of Wilkes Barre, Pennsylvania. Box 494-SCC.

CRANE—THEW—UNIVERSAL—MODEL 35—25' boom clamshell—crane including ½ cu. yd. Williams clamshell bucket—center drive cat. Electric starter, 4 cylinder Waukesha 4½"x 6¼" gasoline engine. Also, complete ½ yd. shovel equipment, drag shovel equipment and skimmer scoop equipment together with home-made trailer. Box 468-SCC.

1020 GAS COMBINATION CLAMSHELL-DRAGLINE. Cat mounted. 35' Boom. Waukesha Type "DR" gasoline engine. Located Missouri. Box 625-SCC

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Large Shovels and Draglines
2 Yards and Over

68-C BUCYRUS ELECTRICALLY OPERATED SHOVEL, equipped with 2½-yard manganese front dipper, 3 phase, 60-cycle, 440-volt motors, transformers, cable, reel and approximately 1400 feet of cable all in excellent condition. Reasonable price. Address Box 268-LSD.

FOR SALE

CLASS 14 STEAM DRAGLINE with 2-yard Page bucket. Location Iowa. Very good condition. Surprisingly low price f.o.b. cars

ALSO

2-YARD MONIGHAN STEAM DRAGLINE in fair condition—cheap. Box 419-LSD.

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50-B STEAM SHOVEL, Number 3946; equipped with 1½-cubic-yard dipper, 26-foot boom, also 1½-cubic-yard dragline bucket with 50-foot boom caterpillar mounted, equipped for burning oil, located at Texarkana, Ark. Price very reasonable. Box 112-LSD.

CLASS-24 BUCYRUS-ERIE STEAM DRAGLINE, shop number 912; 115-foot boom, 3½-cubic-yard Page bucket. Florida location. Box 73-LSD.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer
South Milwaukee, Wisconsin

TYPE 175-B ELECTRIC, No. 794 equipped with 87' shovel boom, 48' dipper handle, 3½-yd. bucket, and dragline equipment including 125' boom, and 3½-yd. bucket. This machine was recently reconditioned and is in good operating condition. Present location, Connecticut. Box 263-LSD.

IN SOUTH CAROLINA near Marietta, 70-C STEAM SHOVEL.

IN KENTUCKY near Nonnell, 225-B STEAM SHOVEL.

Bargains as source of spare parts. Box 558-LSD.

50-B STEAM BUCYRUS-ERIE
COMBINATION SHOVEL AND DRAGLINE

26' Boom	1 KW 32 Volt Moon Electric Light Plant
17' Dipper Handle	
2 yard Dipper	Boiler—Standard coal burning locomotive type 54"x9'7"
50' Boom Dragline Equipment	

1¾ cubic yard Page Bucket

INCLUDING

2 steel under-frame flat cars on which machine now loaded. New 1929. Shop No. 10557. Moved only 200,000 yards material. Excellent condition. Deal direct with owner.

PRICE VERY ATTRACTIVE

Box No. 465 LSD.

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FOR RENT

2-W Monighan Walking Dragline 65 foot boom, 2 yard bucket, 80 H.P. Fairbanks Morse Diesel engine. Used on three jobs. Excavated less than 200,000 yards. Present location on Mississippi River near Cairo. Accessible to barge. Can be demonstrated. Box 606-LSD.

225-B SHOVEL, 6 and 7-yard dipper with caterpillars and track type equipment—in first-class condition. Located in northern Missouri. Box 452-LSD.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Large Shovels and Draglines
2 Yards and Over
Continued

BUCYRUS 320-B STEAM STRIPPING SHOVEL, shop number 4205, new in 1925, used less than four years. Located at Toronto, Ohio. Box 74-LSD.

70-C BUCYRUS STEAM SHOVEL on Cats. Complete. In operating condition. Shop number 1712. Also one extra three-yard Manganese dipper and sticks. Chicago territory. Box 347-LSD.

FOR SALE OR RENT
TWO CLASS 14 STEAM DRAGLINES, caterpillar mounted, equipped for burning gas or oil. Located, Southwest. Box 619-LSD

Locomotives

1 18-TON VULCAN LOCOMOTIVE No. 387, 10x16 cyl., 36" gauge.

1 40-TON VULCAN LOCOMOTIVE No. 3295, 14.22 cylinders, link valve motion, standard gauge.

1 40-TON DAVENPORT LOCOMOTIVE No. 2189, new May 1931, 14x20 cylinders, link valve motion, standard gauge.
Box 100-L.

LOCOMOTIVES

6 BALDWIN, 17x24, straight drive standard gauge 45 ton locomotives. 54 inch boilers. Shop numbers from 32,750 to 34,611. Each one has passed State Boiler Inspection yearly. Boilers will stand cold water test of 240 lbs. At present in actual service in Minnesota mine. Box 152-ME.

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Two 40-ton, 6-wheel switchers. Recently overhauled and rebuilt. Two 50-ton 6-wheel switchers. In excellent condition. Location Chicago. Box 306-ME.

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WANTED
20 Good used, Sanford-Day, Drop-Bottom Mine Cars, 42" gage, 3 or 4 ton capacity. 539-ME.

3 15-TON SANFORD-DAY DROP BOTTOM CARS, 36" gauge, link couplers.
6 40-TON SANFORD-DAY DROP BOTTOM CARS, without air brakes, standard railroad couplers, standard gauge.
2 12-YARD WESTERN, 2 WAY DUMP CARS, standard gauge.
3 6-YARD WESTERN, 2 WAY DUMP CARS, 36" gauge.
Box 100-DC.

10—STEEL ORE CARS, 100,000 LB. CAPACITY. Air brakes, automatic couplers, drop bottom. Location Georgia. Box 614-DC

Miscellaneous Equipment

CONTRACTORS EQUIPMENT
Priced to Sell

Boilers
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Gasoline locomotives
Drill press
Power press
Hand drill presses
Sectional metal powder magazine
Concrete mixer
Bulldozers
Drill steel sharpeners
Spreader car
Trailer, 30 ton
Tractors
Track shifter
Rock screen
Misc. Timbers, 12x12x16
2 cu. yd. steam shovel
¾ cu. yd. steam shovel
⅜ cu. yd. Air tunnel shovel
Diesel shovel
Combination gasoline shovel
Dragline buckets
Graders

All excellent values at prices quoted. Location, New York, Massachusetts and Pennsylvania.
Write for complete description, price and shipping point. Box 613-ME.

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7—60 H.P. CATERPILLAR TRACTORS with enlarged blocks, increasing the horse power to 67½ H.P., also 12-Euclid Crawler Type Wagons 7-8 yd. capacity. All equipment in excellent condition. Located at Belle Plaine, Minnesota. Box 637-ME.

The Bargain of the Year

ONE COMPLETE NARROW GAUGE DIRT MOVING OUTFIT including camps, shop and haulage equipment. Located near Fort Wayne, Indiana. Can you use it?

54 Steel bunks with mattresses and bedding. Mattresses and bedding are sewed up in burlap.
6 Heating stoves.
50 Shovels and picks, approximate.
1 Fairbanks Morse gasoline engine and 5x5 bulldozer pump 3 HP.
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4 Track jacks, 15 ton.
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1 Duplex Pump—Worthington, 5¼x3-½x5.
10 Slips.
1 Anvil.
1 Forge.
6 Switches.
4 Frogs.
10 Switch points.
2 Each, scythes, hand saws, cant hooks, spike malls.
1 Carbide light.
1 Kitchen outfit.
30 Western dump cars, 5-yard.
1 36x84" vertical boiler.
1 6" centrifugal pump with upright engine attached.
2 Galvanized water tanks, wagon size.
1 26' Bare Boom, 1 17' Handle, 1 1¾ yd. dipper for 50-B Steam Shovel.
Will consider individual sale of separate items.

Address Box 449 ME.

NEW 50-B ROPE CROWD BOOM, 35' long and 16' dipper stick (no dipper), for 50-B Diesel shovel. Price $500. Box 638-ME

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The Excavating Engineer
South Milwaukee, Wis.

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Offered for sale by Southern contractor. Priced to sell.
7—Railroad Type Steam Shovels 2½ to 5 yd.
3—Full Revolving Shovels, ¾ yd.
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2—Locomotives, 26 Ton, American Saddle Tank.
32—12-yd. Western Heavy Duty Dump Cars.
3—Camp Cars.
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2—1-bag Gasoline Concrete Mixers.
Pumps, Boilers, Jacks and Other Tools.
For further particulars, Address Box 138-ME.

SHOVEL FRONT END for Bucyrus-Erie B-2 steam machine consisting of 19'9" new style heavy boom, 16' new style heavy dipper handle, and ¾ yard C.F.I.T. dipper. Box 584-SFE.

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ONE No. 13 or No. 16 Allis-Chalmers Superior McCully crusher. Give full details and price. Address American Sand Co., Turner, Kansas.

GASOLINE BLAST HOLE DRILL—self-propelling type—27' derrick for manila rope, complete with tools and cables for drilling 4½" and 5⅝" blast holes or water wells. Located Ohio. Immediately available, subject prior sale. Attractive price. Box 582-BHD.

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PARTS—175-B Shovel—PARTS

1 Boom
1 Dipper Shaft
1 Crowding Engine
1 Five Yard Dipper

If interested in making a good buy on these shovel parts, write us. Box 607-ME.

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